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REPORT

OF THE

ADJUTANT-GENERAL,

State of Connecticut,

TO THE

COMMANDER-IN-CHIEF,

NOVEMBER 30, 1891.

PRINTED BY ORDER OF THE LEGISLATURE.

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REPORT.

State of Connecticut,
Adjutant-General's Office,
Hartford, November 30, 1891.

To His Excellency, Morgan G. Bulkeley,
Commander-in-Chief:

Sir, — Again I have the honor to report upon the condition of the Brigade of Connecticut National Guard, and other armed bodies authorized by the Militia law of the State, and the work performed during the past twelve months.

ORGANIZATION AND MEMBERSHIP.

The force remains the same in organization as reported December 1, 1890, and is as follows:

Brigade of C. N. G.	Organizations.	Officers.	Enlisted Men.	Total.
Brigade Headquarters,	Brigade Commander and Staff,	10	3	13
First Regiment Infantry,	Field, Staff, N. C. S., & Band,	10	26	
	10 Companies,.	30	609	
	1 Hospital Corps, ...	...	4	
	1 Signal Corps, ...	1	8	
	1 Machine-Gun Platoon, . .	1	8	697
Second Regiment Infantry,	Field, Staff, N. C. S., & Band,	10	25	
	10 Companies, ...	28	624	
	1 Hospital Corps, ...	....	5	
	1 Signal Corps, ...	1	8	
	1 Machine-Gun Platoon, . .	1	8	710
Third Regiment Infantry,	Field, Staff, N. C. S., & Band,	10	24	
	8 Companies, ...	22	454	
	1 Hospital Corps, ...	....	5	
	1 Signal Corps, ...	1	9	
	1 Machine-Gun Platoon, . .	1	8	534
Fourth Regiment Infantry,	Field, Staff, N. C. S., & Band,	10	23	
	8 Companies, ...	24	462	
	1 Hospital Corps, ...	....	5	
	1 Signal Corps, ...	1	9	
	1 Machine-Gun Platoon, . .	1	8	543
Infantry, ...	2 Separate Companies, . .	6	99	105
Battery "A," Lt. Artillery,	2 Platoons, ...	5	69	74
Brigade, ...	52 Organizations, ...	173	2,503	2,676
Governor's Guard.				
First Foot, Hartford, . .	1 Company, ...	6	106	
Second Foot, New Haven,	1 Company, ...	3	50	
First Horse, Hartford, . .	1 Troop, ...	5	64	
Second Horse, New Haven,	1 Troop, ...	7	63	304
Total, ...	56 Organizations, ...	194	2,786	2,980

Showing a gain of 49 officers and enlisted men in the National Guard of the State, as compared with the membership one year ago. Eight companies of Infantry have the maximum strength allowed by law, 3 officers and 65 enlisted men. The smaller organizations — Machine-Gun Platoons and Corps — readily maintain a full membership, and, as a rule, contain an exceptional class of young citizen soldiers. Nearly all the Governor's Guard commands show increased membership, notably the First Company of Foot, which is rapidly gaining its maximum, 6 officers and 112 enlisted men. A record of 120 years continuous service and a high standard of drill and discipline, makes this a deservedly popular organization. Reports of Governor's Guard Commandants are on pages 101–107.

SPRING PARADES, MAY, 1891.

The usual spring parades of all organizations are reported as having been successfully carried out, to the benefit of all concerned, part of the day being used for instruction in guard duty and skirmish drill, and the remainder spent at the rifle ranges, qualifying the different classes of marksmen. Many of the organizations are specially commended by the Field and Staff officers in charge for excellent work during the entire day. The following results are reported by the several officers detailed to inspect the work:

FIRST REGIMENT, COLONEL CHARLES B. ERICHSON, 13 ORGANIZATIONS.

Companies.	A	B	C	D	E	F	G	H	I	K	H. C.	S. C.	M.-G.P.	Total.
Present	59	57	67	60	68	42	66	53	61	47	5	10	9	604
Absent	5	3	1	8	0	11	2	10	7	6	0	0	0	53
Present and Absent	64	60	68	68	68	53	68	63	68	53	5	10	9	657

Per cent. present, 91.93.

Qualification, 4th Class, 127; 3d Class, 79; 2d Class, 233.

SECOND REGIMENT, COLONEL JOHN B. DOHERTY, 13 ORGANIZATIONS.

Companies.	A	B	C	D	E	F	G	H	I	K	H. C.	S. C.	M.-G.P.	Total.
Present	65	61	65	66	64	61	66	57	64	58	6	10	9	652
Absent	3	6	1	2	3	7	0	5	1	5	0	0	0	33
Present and Absent	68	67	66	68	67	68	66	62	65	63	6	10	9	685

Per cent. present, 95.18.

Qualification, 4th Class, 122; 3d Class, 77; 2d Class, 231.

THIRD REGIMENT, COLONEL GEORGE HAVEN, 11 ORGANIZATIONS.

Companies.	A	B	C	D	E	F	G	I	H. C.	S. C.	M.-G.P.	Total.
Present	50	59	62	36	57	44	52	58	7	10	9	444
Absent	3	6	3	11	4	8	2	7	0	0	0	44
Present and Absent	53	65	65	47	61	52	54	65	7	10	9	488

Per cent. present, 90.98.
Qualification, 4th Class, 89; 3d Class, 62; 2d Class, 145.

FOURTH REGIMENT, COLONEL HENRY SKINNER, 11 ORGANIZATIONS.

Companies.	B	C	D	E	F	G	I	K	H. C.	S. C.	M.-G.P.	Total.
Present	56	38	60	58	45	44	63	49	6	10	9	438
Absent	4	15	7	6	14	11	1	9	0	0	0	67
Present and Absent	60	53	67	64	59	55	64	58	6	10	9	505

Per cent. present, 86.73.
Qualification, 4th Class, 67; 3d Class, 65; 2d Class, 133.

First Separate Company — Present, 44; absent, 16; total, 60. Per cent. present, 73.33. Qualified, 4th Class, 5.

Second Separate Company — Present, 50; absent, 5; total, 55. Per cent. present, 90.91. Qualified, 4th Class, 13; 3d Class, 3; 2d Class, 11.

Battery "A" — 1st Platoon, present, 27; absent, 4. 2d Platoon, present, 38; absent, 2. Total: present, 65; absent, 6. Present and absent, 71. Per cent. present, 91.55.

The report of Captain Daniel S. Lathrop, commanding 1st Separate Company, is published on page 100, as a record of commendable instruction and a sample of wholesome brevity.

DRILL SEASON, NOVEMBER 1, 1890, TO JUNE 1, 1891.

It was apparent at the encampment in August that the drill season of seven months had been one of advancement in the whole Brigade. General Orders No. 22, A.-G. O., October 10, 1890, directed, as the desire of the Commander-in-Chief, that special attention be given to guard duty, and to the skirmish drill, and in the latter that the bugle be habitually used. Also that officers of the Brigade Staff and Regimental Field and Staff officers be detailed to "visit, observe, and if necessary supervise," drills of Companies, Corps, and Platoons, and make report to Regimental, Brigade, and General Headquarters. This drill inspection was not as general as it should have been, or as it is believed it will be during the present season. Still, the result of better acquaintance, and as a consequence greater confidence and respect between the Staff and Line was evident, and the incentive to study on all hands was a clear gain to the command. A more uniform system for reports to be made by inspecting officers has been prepared and issued, and if Commandants of Regiments will give the system support much benefit must accrue to the whole command. During the month of July, as an object-lesson, and to test the required squading system, Emergency Calls were sent by telegraph to Captains of Companies, or Senior Officers in localities. The results were very satisfactory, and the attention of officers and men directed to a possible important tour of duty. Details of the assembling are given in Circular, A.-G. O., page 192.

ANNUAL ENCAMPMENT.

The encampment of the Connecticut National Guard this year was notable because it was the first held under the law allowing pay for a longer period than six days.

General Orders No. 18, A.-G. O., dated July 3, 1891, directed Brigadier-General Thomas L. Watson, commanding Brigade C. N. G., to assemble his command at the State Camp Ground, Niantic, Conn., on Saturday, August 15, 1891, for an *eight* days tour of duty and instruction.

The policy of attempting to require the officers and men to devote more than six days to an encampment had been questioned, many professing to believe it would result in greatly reduced attendance. There was also great fear in some quarters that a Sabbath in camp would be an exhibition of riotous conduct, a debauch that would disgrace the Guard and the State. The "morning report" of Saturday, August 15th, showed an attendance of within a fraction of 94 per cent. of the total strength of the command, a figure never before attained. Battery "A" took into camp 99 per cent.; the 1st Regiment 90 per cent.; 2d Regiment 97 per cent.; 3d Regiment 95 per cent.; 4th Regiment 95 per cent., and the Separate Companies 90 per cent. and 88 per cent. respectively. Reference to a comparative table covering the attendance in all organizations each day at the three encampments of your administration, 1889–90–91, shows a considerable increase at the last over all others. The Sunday in "Camp Watson" was a day of marked decorum, the ceremonies of Guard mounting in the morning and Brigade dress-parade at evening being the only work done.

Religious services were held in the morning at all Regimental Headquarters, largely attended by officers and men. At a large tent, erected for the use of the Y. M. C. A., the Catholic members of the command assembled for a service conducted by the Vicar-General, and in the evening a union praise service was held at Brigade Headquarters, all denominations taking active part.

The question of attendance and Sabbath-breaking was settled. As to the benefit of an eight-days encampment there can be no doubt. At "reveille" on Monday morning the Brigade began work in better form than has heretofore been usual on *Wednesday* morning, when the troops have gone into camp on Monday. It is a clear gain of two days for good hard work, appreciated, I believe, by officers and men, and it will be a step backward to ever again have a six-days encampment of the Connecticut National Guard.

For details of routine and other work performed, I refer to the able reports of Brigadier-General Watson, Majors Ingalls and Burdett of his staff, and the report of Lieutenant W. H. H. Bowen, 5th Infantry, U. S. A., detailed by the Secretary of War to "visit and inspect" the Camp. Since you were an observer of the encampment for six days, I need not mention the excellence of the work done, nor the earnest efforts of officers and men to gain military knowledge; the encampment of the Connecticut National Guard of 1891 was the best in every respect it has been my privilege to attend. No small share of the credit for the good results is due to the efforts of Quartermaster-General Rudd and his efficient assistant, Colonel H. C. Morgan. Their arrangements for the care and comfort of officers and men were all that could be desired.

RIFLE PRACTICE.

The practice at the Ranges has, I judge from the reports of Inspectors of Rifle Practice, been fully as satisfactory and beneficial as in any former year. The season culminated in a "Brigade Tournament," or State Rifle match, held on the 21st of October, 1891, in charge of the Brigade Commander.

Teams of twelve from each of the four regiments competed, and the day was an enjoyable one, fruitful in good results, and stimulating to healthy and desirable rivalry in marksmanship in the several regiments of the Brigade.

The first prize was won by the Third Regiment team.
The second " " " First " "
The third " " " Second " "

The members of the "first prize" team each received a handsome medal from the State.

FALL MUSTER AND INSPECTION.

The inspection of arms, equipments, clothing, and armories having just been completed by the Quartermaster-General of the State, it was deemed unnecessary to, at this time, go over the same ground; therefore, the Brigade Commander was directed in G. O. No. 27, A.-G. O., Oct. 17, 1891, to muster his command and make report to the Commander-in-Chief. Before the end of the drill season, when it is fair to presume all organizations will be at the best, a thorough inspection would seem desirable to ascertain what benefit had been derived from the drills by officers and men, and to know what commands, if any, should be disbanded, or what officers, if any, should be removed, because of indifference or inefficiency, also the condition of State property in the hands of commanding officers.

NEW DRILL REGULATIONS.

General Orders No. 28, A.-G. O., Nov. 7, 1891, directed that commandants of Infantry Companies at once inaugurate schools for officers and non-commissioned officers in the "drill regulations" recently approved by the Secretary of War for use in the army and the militia of the United States, and issue was made of a compilation of the "School of the Soldier," "School of the Company," and the "Extended Order." It was not deemed advisable to order the radical change in drill for the command until the officers had qualified themselves by study to teach the men under them. It is believed that by February 1, 1892, officers will be competent to instruct, and that the greater half of the present drill season may be devoted to the practice of the new regulations throughout the Brigade.

MOBILIZATION OF THE NATIONAL GUARD.

In accordance with your instructions in General Orders No. 26, A. G. O., October 10, 1891, I had the honor to attend the Convention of Officers of the National Guard held at Chicago, beginning on Tuesday, October 27, 1891.

The object of holding the Convention was "to canvas the military features at the dedication ceremonies in 1892," and "incidentally to take up the subject of an encampment of the National Guard at Chicago in 1893." Delegates were present from 34 States and Territories, and it was the unanimous opinion that an encampment of the entire National Guard or Volunteer Militia of the Union should be held in Chicago during August, 1893. It was voted to petition Congress to appropriate a sum sufficient to establish and maintain such a camp, and to transport and subsist the troops. Under such conditions it was believed an exhibit could be made of an army of 100,000 men (90,000 Volunteers and 10,000 Regulars). The educational advantages of such an encampment to officers and men would be of inestimable value, and there can be no argument advanced against the propriety of Connecticut being represented by our compact National Guard organization, *the Brigade intact.*

EXPENSES OF THE NATIONAL GUARD.

The following amounts have been disbursed by the respective departments on account of the military of the State during the year ending June 30, 1891:

Adjutant-General (for printing, stationery, and general office expenses),	$2,560 11
Quartermaster General,	60,990.46
Paymaster-General,	46,234.08
Comptroller (for salaries, office expenses, etc., and audit),	10,675.60
	$120,460.25

WAR RECORDS, PENSION AND BENEFICIARY WORK.

The growing demands upon the Adjutant-General's Office in connection with records of service, pension claims, and all matters arising from the settlement of affairs of the veteran soldiers of Connecticut, and the work pertaining to the Soldiers' Home at Noroton, Connecticut, makes an increase of clerical force in this department imperative.

Colonel George M. White, Assistant Adjutant-General, has had entire charge of this business in the office for the past seven years, and it is owing to his systematic methods that the volume of work has been accomplished with any degree of promptness. The following brief statement will partially show the work of the past year:

PENSION CLAIMS FILED.

Original claim, soldier,	153
Original claim, widow,	74
Original claim, mother,	4
Original claim, minor,	9
Increase claim,	21
Accrued,	16
Bounty, back pay, etc.,	2
Amendment of record,	7
Mexican,	1
Total claims filed,	287

PENSION VOUCHERS EXECUTED.

Pensions accruing Dec. 4, 1890, 202; cash amount,	$7,828.53
Pensions accruing Mar. 4, 1891, 217; cash amount,	9,113.19
Pensions accruing June 4, 1891, 237; cash amount,	13,739.60
Pensions accruing Sept. 4, 1891, 268; cash amount,	11,715.84
Total from Nov. 30, 1890, to Nov. 30, 1891,	$42,397.16
Total amount collected on vouchers executed in this office since June, 1871,	$652,256.53

Since the passage by Congress of the Act of June 27, 1890, modifying the Pension laws, there has been filed through this office 719 claims for pension.

From Nov. 30, 1890, to Nov. 20, 1891, 187 claims have been granted with a total amount of first payment of $25,607.50.

All pension vouchers are executed free of cost to the pensioner in this office; and one day each quarter, when payment on such vouchers become due, the business of this office is entirely devoted to that work.

There has been during the year 366 applications for admission to the Soldiers' Home and Hospital received and filed, and 458 permits for admission and transfer granted and sent to individuals interested. The extent of the correspondence, auditing of monthly and quarterly accounts for hospitals, and the tri-monthly, quarterly, and annual reports from the Soldiers' Home and Hospital, makes a mass of detail that is simply overwhelming for the force at hand, and interferes with the prompt attention to the regular work of the Adjutant-General's Office.

RECOMMENDATIONS, ETC.

All the recommendations made by General Watson and myself last year still hold good.

The pressing need of the Brigade is *new rifles*. So good a command is deserving of the *best* arm. For purposes of active service they might about as well carry the "flint lock of the fathers" as that they now have. The present armament is a discredit to the Commonwealth. New Blouses are needed, and many uniforms should be repaired and not a few renewed.

The adoption of the new drill regulations of the U. S. Army for practice in the Connecticut National Guard, is sufficient reason for revision or amendment of the military law of the commonwealth, at least as to organization. (Chapter cxc, sections 3148, 3150, 3151, etc.)

In view of the fact that these regulations contemplate regiments of twelve companies, in three battalions, four companies each, it is desirable that the four regiments of the brigade be made into two battalions of regulation size, to wit, four companies each.

If it is ever required, for active service, to raise the regiments to twelve companies each, a third battalion could be readily and well officered from the commissioned and non-commissioned officers of the two organized, drilled, and disciplined battalions of the regiments.

I would not recommend a change in the present number or grade of field officers, but I do recommend the increase of the maximum strength of companies from 68 to 76, to wit, 73 enlisted men and 3 commissioned officers.

This would reduce the line strength of the 10-company regiments (1st and 2d) by 72 enlisted men each, and increase the 8-company regiments (3d and 4th) by 64 enlisted men each. The numerical strength of the brigade would remain practically as now, and the organization be in form to correspond with regulations, the undesirable and cumbersome feature of odd companies would be eliminated.

I trust the necessary change may soon occur, either by legislation or by your orders.

Substantial kitchens, properly equipped, is one of the absolute necessities at the State camp ground, for the proper economical and uniform preparation of the rations during encampments, and I endorse the suggestion of General Watson that the Commissary-General's Department should be in charge of messing while the troops are in camp.

I have the honor to present herewith reports, tabulated statements, etc., as follows:

1. Roster of the Commander-in-Chief and Staff and the National Guard, November 30, 1891.
2. Military Enrollment, fall of 1890.
3. Reports of Surgeon-General and Medical Director, C. N. G., Brigadier-General Watson, Commanding Brigade, 1st Lieutenant Wm. H. C. Bowen, 5th Infantry, U. S. A., Majors Ingalls and Burdett, Brigade Staff, and Captain D. S. Lathrop, 1st Separate Company.
4. Reports of Commanding Officers Governor's Guards.
5. Report of Examining Board.
6. Report of Board of Survey.
7. General Orders, Important Special Orders, and Circulars.

I am, Sir, very respectfully, your obedient servant,

ANDREW H. EMBLER,
Adjutant-General.

ROSTER.

COMMANDER-IN-CHIEF AND STAFF

AND THE

CONNECTICUT NATIONAL GUARD.

NOVEMBER 30, 1891.

ROSTER.

COMMANDER-IN-CHIEF AND STAFF.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Commander-in Chief.					
Governor MORGAN G. BULKELEY, Hartford; inaug. Jan. 10, 1889.	Hartford.	53	East Haddam, Conn.	13th Regt. N. G., State of N. Y. Apr., 1861, to Feb., 1872.	Private Co. G, 13th Regt. Inf. N. Y. Vols., May 28, 1862; dis. Sept. 12, 1862.
STAFF. *Adjutant-General.*					
Amdrew H. Embler, New Haven; Jan. 10, 1890.	New Haven.	57	New York, N. Y.	Private Co. H, 71st Reg. N. Y. S. M., 1854; 1st Lieut. April, 1861; Capt. Aug., 1861. First Lieut. Co, K, 2d Reg. N. Y. S. M, (82d Regt. Vols.), Nov., 1861; Capt. Co. E, July, 1862. Captain 1st Co. G. F. G., Conn., 1879; Major. 1880; res. Jan. 30, 1882. Captain Co. D, 2d Regt. C. N. G., Nov. 20, 1884. Adjutant General State of Conn., Jan. 10, 1890.	1st Sergt. Co. H, 71st Regt. N. Y. S. M., April 19, 1861; 1st Lieut; M. o. July 24, 1861, exp. term service. 1st Lieutenant Co. K, 2d Regt. N. Y. S. M. (82d Regt. N. Y. Vols.), Nov., 1861; Capt. Co. E, July, 1862; Capt. U. S. Vols. and A.-D.-C. to Major-Gen. John Gibbon, commanding 2d Div., 2d A. C., Army of the Potomac, May, 1864; Major U. S. Vols. and A. D. C. to Maj. Gen. John Gibbon, com'd 24th A. C., Army of the Potomac, Jan., 1865; wounded July 21, 1861, Sept. 17, 1862 and May 5, 1864; hon. dis. Dec., 1865.

Quartermaster-General. Brigadier-General Wm. B. Rudd, Lakeville; Jan. 10, 1889.	Lakeville.	53	Fredonia, N. Y.	Private Co. A, 54th Regt. N. G. S. N. Y., 1857. Adjutant 107th Regt. N. G. S. N. Y., 1865. Colonel and A.-D.-C. on Staff of Commander-in-Chief State of Conn., Jan. 5, 1881; hon. dis. Jan. 3, 1883. Quartermaster-General State of Conn., Jan. 10, 1889.	Private 98th Regt. N. Y. Vols., July 6, 1861; Sergt.-Maj. Oct. 1861; Lieut. Co. K, May, 1862; res. Oct. 28, 1862.
Surgeon-General. Brigadier-General Henry Hungerford, Stamford; Jan. 10, 1889.	Stamford.	34	Brooklyn, N. Y.		
Commissary-General. Brigadier-General Eugene S. Boss, Windham; Jan. 10, 1889.	Willimantic.	49	Windham, Conn.		
Paymaster General. Brigadier-General Wallace T. Fenn, Wethersfield; Jan. 10, 1889.	Wethersfield.	43	New Haven, Conn.	Private Co. K, 1st Regt. C. N. C., Feb. 11, 1879; Commissary-Sergt. March 31, 1880; disc. Feb. 3, 1884. Re-en. Feb. 11, 1884, Commissary-Sergt; dis. Feb. 11, 1886. Re-en. Feb. 11, 1886, Commissary-Sergt.; 1st Lieut. and Paymaster 1st Regt. C. N. G., April 22, 1886; res. Jan. 10, 1889, to accept appointment on staff of Gov. Bulkeley. Paymaster General State of Conn., Jan. 10, 1889.	
Aid-de-Camp. Colonel William C. Skinner, Hartford; Jan. 10, 1889.	Hartford.	36	Malone, N. Y.		
Aid-de-Camp. Colonel James Y. Fairman, Middletown; Jan. 10, 1889.	Middletown.	35	New Haven, Conn.	Private Co. F, 2d Regt. C. N. G., Nov. 3, 1873; dis. Nov. 30, 1875. Col. and A.-D. C., State of Conn., Jan. 10, 1889.	

COMMANDER-IN-CHIEF AND STAFF.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Aid-de Camp.					
Colonel Henry S. Redfield, Hartford; Jan. 10, 1890.	Hartford.	26	Hartford, Conn.	Private Co. K, 1st Regt. C. N. G., Apr. 24, 1883; Corp; dis. April 24, 1888. Re-en. May 4, 1888, Sergt.; Sergt.-Major Mar. 12, 1889; dis. Jan. 10, 1890, to accept appointment on Staff of Commander-in-Chief.	
Aid de Camp.					
Colonel William E. A. Bulkeley, Hartford; Aug. 8, 1890.	Hartford.	24	Hartford, Conn.		
Assistant Adjutant-General.					
Colonel George M. White, New Haven; Jan. 8, 1885.	Hartford.	54	Wardsboro', Vt.	A. A.-G. State of Conn., Jan. 8, 1885; re-appointed, Jan. 6, 1887; re-appointed, Jan. 10, 1889.	2d Lieut. Co. C, 1st Regt. Conn. Vols. (3 months), May 16, 1861; M. o. July 31, 1861. Captain Co. E, 15th Regt. Conn. Vols, July 12, 1862; captured in action, Kinston, N. C., March 8, 1865; dis. May 15, 1865.

Assistant Quartermaster-General. Colonel Henry C. Morgan, Colchester; Jan. 6, 1887.	Hartford.	49	Brooklyn, N. Y.	Asst. Q. M.-Gen. State of Conn., Jan. 5, 1881; hon. dis. Jan. 3, 1883. Asst. Q. M.-Gen. State of Conn., Jan. 6, 1887; re-appointed Jan. 10, 1889.	1st Lieut., 12th Regt. U. S. Inf., May 14, 1861; Capt. June 16, 1863; wounded twice; lost left leg at battle of the Wilderness; brevet Major U. S. A., July 2, 1863; brevet Lieut.-Colonel U. S. A., May 5, 1864; trans. to 30th Regt. U. S. Inf. Sept. 21, 1866; retired Feb. 17, 1868.

CONNECTICUT NATIONAL GUARD.

Brigadier-General. Thomas L. Watson, Bridgeport; Mar. 1, 1890.	Bridgeport.	44	Bridgeport, Conn.	1st Lieut. and Paymaster 4th Regt. C. N. G., May 28, 1877. Capt. and A.-D.-C. Brigade Staff, July 6, 1878; Major and Brigade Quartermaster, Jan. 30, 1879; Colonel 4th Regt. C. N. G., Apr. 23, 1884; Brigadier-General commanding Brigade C. N. G., Mar. 1, 1890.	
Assistant Adjutant-General. Lieutenant-Colonel Louis N. Van Keuren, Bridgeport; March 6, 1890.	Bridgeport.	41	Wartsborough, N. Y.	Private Co. C (Bridgeport), 4th Regt. C. N. G., Sept. 11, 1884; dis. by disbandment of Co. Dec. 19, 1884. Capt. and Adjt. 4th Regt. C. N. G., Jan. 10, 1885. Lieut.-Colonel and A. A.-G. of Brigade C. N. G., Mar. 6, 1890.	
Brigade Inspector. Major Phineas H. Ingalls, Hartford; May 12, 1890.	Hartford.	35	Gorham, Me.	First Lieut. and Assistant Surgeon 1st Regt. C. N. G., Aug. 17, 1883; Capt. and Adjt. Dec. 23, 1884; dis. Jan. 22, 1880. Major and Brigade Inspector C. N. G., May 12, 1890.	

CONNECTICUT NATIONAL GUARD. — CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Brigade Quartermaster. Major Howard G. Hubbell, Bridgeport; May 12, 1890.	Bridgeport.	43	Bridgeport, Conn.	Private Co. B, 8th Regt. C. N. G., Aug. 11, 1866; Sergt. (changed to Co. B. 4th Regt., Aug. 1, 1871); dis. Sept. 4, 1871. 1st Lieut. and Q.-M. 4th Regt. C. N. G., May 16, 1884. Major and Brigade Quartermaster C. N. G., May 12, 1890.	
Brigade Commissary. Major Isaac Bromley, New Haven; May 12, 1890.	New Haven.	35	New Haven, Conn.		
Brigade Inspector of Rifle Practice. Major Edward I. Williams, Cheshire; July 24, 1890.	Cheshire.	29	Essex, Conn.	Private Co. D, 2d Regt., C. N. G., Nov. 15, 1883; Corp. Aug. 1, 1884; Sergt. Nov. 15, 1886; 2d Lieut. March 10, 1887; 1st Lieut. March 22, 1888; res. Jan. 6, 1890. Major and Brigade I. R. P., C. N. G., July 24, 1890.	
Medical Director. Lieut.-Colonel George L. Porter, Bridgeport; May 12, 1890.	Bridgeport.	53	Concord, N. H.	Major and Surgeon 4th Regt. C. N. G., Mar. 8, 1887. Lieut.-Colonel and Medical Director C. N. G., May 12, 1890.	Acting Asst. Surg. U. S. A. April, 1862; 1st Lieut. and Asst. Surgeon U. S. A., July 16, 1862; Capt. 1867; res. July 16, 1868. Wd. at Boonsboro, Md. Brevet Capt. and Brevet Major U. S. A., March 13, 1865.

Engineer and Signal Officer. Major Charles L. Burdett, Hartford; June 14, 1883.	Hartford.	43	Nantucket, Mass.	Private Co. K, 1st Regt. C. N. G., Apr. 13, 1880; Corp. Jan. 12, 1881; Major and Engineer and Signal Officer C. N. G., June 14, 1883.
Aid-de-Camp. Captain Gilbert C. Bishop, New London; May 12, 1890.	New London.	24	New London, Conn	Private 3d M. G. Platoon 3d Regt. C. N. G., Sept. 29, 1885; Comsy.-Sergt. 3d Regt. C. N. G., Jan. 18, 1887; 1st Lieut. and P. M. July 16, 1888. Captain and A.-D.-C. Brigade Staff C. N. G., May 12, 1890.
Aid-de-Camp. Captain John P. Kellogg, Waterbury; May 12, 1890.	Waterbury.	32	Waterbury, Conn.	Private Co. A, 2d Regt. C. N. C., Dec. 6, 1886; dis. Nov. 19, 1887. Captain and A.-D.-C. Brigade Staff C. N. G., May 12, 1890.

LIGHT ARTILLERY.

BATTERY A.—GUILFORD.

Captain. Arthur S. Fowler, Guilford, 1879; March 11, 1886.	Guilford.	48	Guilford, Conn.	Private 1st Sec. Batt'y C (Guilford), C. N. G., May 8, 1881 (changed to 2d Sec. Batt'y A, Aug. 1, 1871; to 2d Sec. Lt. Arty. C. N. G., Nov. 1, 1871; and to 1st Sec. Lt. Arty. C. N. G., Mar. 29, 1875); Corp.; dis. May 16, 1879. Re.-en July 28, 1879 (changed to 1st Platoon Lt. Arty. C. N. G., Apr. 15, 1880, and to 1st Platoon Batt'y A, C. N. G., November 28, 1881); Corp.; Sergt; dis. July 27, 1881. Re-en. Sept. 3, 1881; Sergt.; 2d Lieut. Dec. 5, 1881; 1st Lieut. Jan. 22, 1883; Capt. Batt'y A, C. N. G, Mar. 11, 1886.

CONNECTICUT NATIONAL GUARD. BATTERY A. — CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
FIRST PLATOON. — GUILFORD. *First Lieutenant.*					
William H. Lee, Guilford; April 11, 1887.	Guilford.	50	Guilford, Conn.	Pivate 1st Sec. Batt'y C (Guilford), C. N. G., June 6, 1865 (changed to 2d Sec. Batt'y A, Aug. 1, 1871; and to 2d Sec. Lt. Arty. C. N. G., Nov. 1, 1871; and to 1st Sec. Lt. Arty. C. N. G., Mch. 29, 1875); Corp. 1872; 2d Lieut. Jan. 2, 1873; 1st Lieut. Nov. 16, 1874 (changed to first Platoon Lt. Arty. Apr. 15, 1880, and to 1st Platoon Batt'y A, Nov. 28, 1881); Capt. Batt'y A, Nov. 28, 1881; res. Mar. 3, 1886. 1st Lieut. 1st Platoon Batt'y A, Apr. 11, 1887.	Private Co. B, 16th Regt. Conn. Vols., July 21, 1862; dis. disab. Dec. 11, 1862.
Second Lieutenant.					
Barlow S. Honce, Branford; Feb. 27, 1888.	Branford.	36	Freehold, N. J.	Private 1st Platoon Batt'y A, C. N. G., Aug. 12, 1883; Corp. Aug., 1884; Sergt. May 17, 1886; 2d Lieut. Feb. 27, 1888.	
SECOND PLATOON. — BRANFORD. *First Lieutenant.*					
James T. Reynolds, Branford; December 17, 1885.	Branford.	35	Branford, Conn.	Private 2d Platoon Batt'y A, C. N. G., May 20, 1884; Corp. May 26, 1884; 2d Lieut. Dec. 15, 1884; 1st Lieut Dec. 17, 1885.	
Second Lieutenant.					
James H. Barker, Branford; January 7, 1886.	Branford.	39	Branford, Conn.	Private 2d Platoon Batt'y A, C. N. G., May 15, 1884; Sergt. Aug. 21, 1885; 2d Lieut. Jan. 7, 1886.	

FIRST REGIMENT (INFANTRY). *Colonel.* Charles B. Erichson, New Britain; April 15, 1890.	New Britain.	45	New Haven, Conn.	Private Batt'y E (New Britain), C. N. G., Aug. 21, 1865; Corp., Sergt., 1st Sergt., 2d Lieut., Aug. 18, 1868; 1st Lieut., Feb. 9, 1869; Capt. Jan. 3, 1871; dis. Aug. 1, 1871 (Batt'y disbanded). Capt. Co. E, 1st Regt. C. N. G., Mar. 25, 1872; res. Sept. 27, 1883. Capt Co. D, Jan. 10, 1890. Colonel 1st Regt. C. N. G., Apr. 15, 1890.	Musician Co. I, 8th Regt. N. Y. Vols., Aug., 1861. Mustered into U. S. service Sept. 13, 1861; dis. Jan. 1, 1862.
Lieutenant-Colonel. Alfred L. Thompson, New Britain; April 15, 1890.	New Britain.	40	Portland, Conn.	Private Co E, 1st Regt. C. N. G., June 20, 1877; Corp. Feb. 7, 1878; Sergt. April 20, 1880; 1st Sergt. Dec. 24, 1881; dis. June 20, 1882. Re-en. June 20, 1882; 1st Sergt.; 2d Lieut. June 22, 1883; Capt. Oct. 3, 1883; Lieut.-Colonel 1st Regt. C. N. G., April 15, 1890.	
Major. John Hickey, So. Manchester; Oct. 30, 1890.	South Manchester.	34	Manchester, Conn.	Private Co. G, 1st Regt. C. N. G., Apr. 2, 1878; Corp. Mar. 1, 1880; Sergt. June 6, 1881; 1st Lieut. Feb. 5, 1883; Capt. Feb. 7, 1887; Major 1st Regt. C. N. G., Oct. 30, 1890.	
Adjutant.—Captain. Lucius B. Norton, New Britain; Aug. 28, 1891.	New Britain.	33	Unionville, Conn.	Private Co. E, 1st Regt. C. N. G., Sept. 1, 1883; Corp.; reduced; dis. Aug. 20, 1887; 1st Lieut. and Quartermaster 1st Regt. C. N. G., May 20, 1890. Capt. and Adjutant 1st Regt. C. N. G., Aug. 28, 1891.	

CONNECTICUT NATIONAL GUARD, FIRST REGIMENT (INFANTRY). — CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Quartermaster.—First Lieutenant. Arthur M. Lane, Windsor, Aug. 28, 1891.	Hartford.	32	Collinsville, Conn.	Private Co. K, 1st Regt. May 20, 1879; dis. June 30, 1882. Re-en. July 16, 1888; Corp., June 18, 1889; Q. M. Sergt. 1st Regt. C. N. G., July 17, 1891; 1st Lieut. and Quartermaster 1st Regt. C. N. G., Aug. 28, 1891.	
Paymaster.—First Lieutenant. William C. Cheney, So. Manchester; May 20, 1890.	Hartford.	27	So. Manchs'r, Conn.	Private Co. K, 1st Regt. C. N. G., Dec. 15, 1886; Corp.; Sergt.; 1st Lieut., and Paymaster 1st Regt. C. N. G. May 20, 1890.	
Surgeon.—Major. Thomas F. Rockwell, Rockville; May 20, 1890.	Rockville.	37	New York, N. Y.		
Assistant Surgeon.—First Lieut. Frank H. Peltier, Hartford; May 20, 1890.	Hartford.	27	Clifton Spgs., N. Y.	Private Co. F, 1st Regt. C. N. G., May 28, 1884; dis. May 28, 1889; 1st Lieut. and Asst. Surgeon, 1st Regt. C. N. G., May 20, 1890.	
Inspector of Rifle Practice.—Capt. Charles H. Faulkner, New Britain; May 20, 1890.	New Britain.	39	New Haven, Conn.	Private Co. D, 1st Regt. C. N. G., Apr. 28, 1874; Sergt.; 2d Lieut. Nov. 20, 1877; res. Feb. 14, 1879, under name of Charles H. Faughnan (name changed); Captain and I. R. P., 1st Regt. C. N. G., May 20, 1890.	
Chaplain. Henry H. Kelsey, Hartford; August 8, 1890.	Hartford.	39	Le Roy, N. Y.		

COMPANY A. — HARTFORD. *Captain.*					
Edward Schulze, Hartford; December 9, 1884.	Hartford.	42	Hessen, Cassel, Germany.	Private Co. A, 1st Regt. C. N. G., Jan. 23, 1872; Sergt. Jan. 31, 1872; 1st Sergt. Sept. 25, 1872; 1st Lieut. Feb. 17, 1874; Capt. Dec. 9, 1884.	Private U. S. Inf. Apr. 20, 1867; assigned to Co. E, 37th Regt.; appointed Comp'y Artificer; transferred to Co. B, 3d U. S. Infantry, dis. April 20, 1870, exp. term ser.
First Lieutenant.					
William C. Herter, Hartford; January 16, 1891.	Hartford.	25	Rahway, N. J.	Private Co. A, 1st Regt. C. N. G., May 18, 1885; Corp. July 6, 1886; Q. M. Sergt. Nov. 20, 1888; dis. May 18, 1890. Re-en. May 19, 1890; Q. M. Sergt; 1st Lieut. Jan. 16, 1891.	
Second Lieutenant.					
James C. Bailey, Hartford; April 18, 1889,	Hartford.	31	England.	Private Co. A, 1st Regt. C. N. G., July 6, 1881; Corp. Feb. 6, 1885; Sergt. May 7, 1885; 1st Sergt. Sept. 11, 1885; dis. July 6, 1886. Re-en. July 6, 1886; 1st Sergt.; dis July 6, 1888. Re-en. July 6, 1888; 1st Sergt.; 2d Lieut. Apr. 18, 1888.	
COMPANY B. — HARTFORD. *Captain.*					
John F. Lawler, Hartford; May 5, 1890.	Hartford.	34	Hartford, Conn.	Private Co. B, 1st Regt. C. N. G., Feb. 4, 1879; Corp. Mar. 13, 1880; Sergt. Aug. 23, 1883; dis. Feb. 4, 1884. Re-en. Feb. 4, 1884; Sergt.; dis. Feb. 4, 1886. Re-en. Feb. 4, 1886; Sergt.; 1st Sergt. June 26, 1886; dis. Feb. 4, 1888. Re-en. Feb. 4, 1888; 1st Sergt.; 2d Lieut. May 30, 1888; 1st Lieut. Jan. 31, 1889; Capt. May 5, 1890.	

CONNECTICUT NATIONAL GUARD, FIRST REGIMENT (INFANTRY). — CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
First Lieutenant. Dennis J. Murphy, Hartford ; October 6, 1891.	Hartford.	31	Hartford, Conn.	Private Co. B, 1st Regt. C. N. G., Feb. 5, 1884 ; Corp. May 12, 1888 ; dis. Feb. 5, 1889. Re-en. Feb. 5, 1889 ; Corpl. ; Sergt. Mar. 4, 1889 ; dis. Feb. 5, 1891. Re-en. Apr. 27, 1891 ; 1st Sergt. Apr. 27, 1891 ; 1st Lieut. Oct. 6, 1891.	
Second Lieutenant. Thomas P. Hastings, Hartford ; October 6, 1891.	Hartford.	25	Clare, Ireland.	Private Co. B, 1st Regt. C. N. G., Feb. 2, 1886 ; Corp. Aug. 2, 1888 ; dis. Feb. 2, 1891 ; Re-en. Mar. 2, 1891 ; Corpl.; Sergt. Apr. 26, 1891 ; 2d Lieut. Oct. 6, 1891.	
COMPANY C. — ROCKVILLE.					
Captain. Martin Laubscher, Rockville ; March 20, 1891.	Rockville.	28	Rockville, Conn.	Private Co. C, 1st Regt C. N. G., Feb. 25, 1890 ; 2d Lieut. Mar. 11, 1890 ; 1st Lieut. Feb. 6, 1891 ; Capt. Mar. 20, 1891.	
First Lieutenant. Edwin L. Bolles, Rockville ; March 20, 1891.	Rockville.	31	Andover, Conn.	Private Co. C, 1st Regt. C. N. G., Feb. 6, 1878 ; Corp. Aug. 11, 1880 ; dis. June 20, 1881 (disbandment of Company). Priv. Co. C, 1st Regt. C. N. G., Feb. 25, 1890 ; 1st Sergt. May 16, 1890 ; 2d Lieut. Feb. 6, 1891 ; 1st Lieut. Mar. 20, 1891.	
Second Lieutenant. Harry M. Loomis, Rockville ; March 20, 1891.	Rockville.	25	New Haven, Conn.	Private Co. C, 1st Regt. C. N. G., Aug. 2, 1890 ; Q. M. Sergt. ; 2d Lieut. Mar. 20, 1891.	

COMPANY D. — NEW BRITAIN.				
Captain. William E. Allen, New Britain; May 5, 1890,	New Britain.	42	New Britain. Conn.	Private Co. D, 1st Regt. C. N. G., Feb. 25, 1873; Corp. May 9, 1877; Sergt. Feb. 26, 1878; dis. Jan. 22, 1879. Re-en. Feb. 1, 1879; 1st Sergt. Feb. 25, 1879; 2d Lieut. April 5, 1881; 1st Lieut. May 18, 1886; Capt. May 5, 1890.
First Lieutenant. Frank W. Humphrey, New Britain; May 5, 1890.	New Britain.	33	Bloomfield, Conn.	Private Co. D, 1st Regt. C. N. G., Jan. 5, 1882; Corp. Feb. 3, 1885; Sergt. June 8, 1886; dis. Jan. 5, 1887. Re en. Feb. 3, 1887; Sergt.; dis. Feb. 3, 1889; Re-en. Mar. 1, 1889; Sergt; 1st Sergt. Aug. 6, 1889; 2d Lieut. Feb. 18, 1890; 1st Lieut. May 5, 1890.
Second Lieutenant. Sidney M. Leonard, New Britain; May 5, 1890.	New Britain.	30	Hoosick Falls, N. Y.	Private Co. D, 1st Regt C. N. G., June 3, 1887; Corp. July 5, 1888; Sergt. June 1, 1889; 2d Lieut. May 5, 1890.
COMPANY E. — NEW BRITAIN.				
Captain. George O. McLean, New Britain; May 5, 1890.	New Britain.	32	Simsbury, Conn.	Private Co. E, 1st Regt. C. N. G., Apr. 16, 1877; Corp. Feb. 7, 1878; Sergt. Apr. 16, 1879; 1st Sergt. Apr. 20, 1880; 2d Lieut. Nov. 23, 1881; 1st Lieut. June 22, 1883. Res. Oct. 20, 1883; Capt. May 5, 1890.
First Lieutenant. John J. Smith, New Britain; March 23, 1885.	New Britain.	35	Ireland.	Private Co. E, 1st Regt. C. N. G., Feb. 28, 1878; Corp. June 15, 1882; Sergt. Jan. 1, 1883; dis. Feb. 28, 1883. Re-en. March 1, 1883; Sergt. March 1, 1883; 1st Sergt. Nov. 28, 1883; 2d Lieut. Feb. 16, 1885; 1st Lieut. Mch. 23, 1885.

CONNECTICUT NATIONAL GUARD, FIRST REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant. John E. Lynch, New Britain; Nov. 25, 1890.	New Britain.	23	New York, N. Y.	Private Co. E, 1st Regt. C. N. G., Nov. 16, 1885; dis. Aug. 16, 1886. Re-en. Nov. 29, 1886; Corp. Aug. 17, 1888; Sergt. Dec. 27, 1889; 1st Sergt. Sept 7, 1890; 2d Lieut. Nov. 25, 1890.	
COMPANY F. — HARTFORD.					
Captain. Clarence H. Wickham, Hartford; Feb. 28, 1890.	Hartford.	32	Whitneyv'le, Conn.	Private Co. F, 1st Regt. C. N. G., July 16, 1879; Corp. Apr. 5, 1882; dis. July 15, 1884. Re-en. July 16, 1884; Corp.; Sergt. Mar. 3, 1885; Com'sy Sergt. 1st Regt. C. N. G., July 1, 1886; dis. July 16, 1886. Re-en. July 16, 1886; Com'sy Sergt.; dis. July 16, 1888. Re-en. July 16, 1888; Com'sy Sergt.; Capt. Feb. 28, 1890.	
First Lieutenant. Louis B. Hubbard, Hartford; Nov. 7, 1887.	Hartford.	30	Middletown, Conn.	Private Co. F, 1st Regt. C. N. G., June 21, 1879; Corp. March 19, 1882; dis. June 21, 1884. Re-en. June 21, 1884; Corp.; Sergt. Dec. 16, 1884; dis. June 21, 1886. Re-en. June 21, 1886; Sergt.; 1st Sergt. Jan. 5, 1887; 2d Lieut. Feb. 7, 1887; 1st Lieut. Nov. 7, 1887.	

Second Lieutenant. Louis N. Mansuy, Hartford; October 8, 1890.	Hartford.	29	Hartford, Conn.	Private Co. F, 1st Regt. C. N. G., July 15, 1881; Corp. Mar. 3, 1885; dis. July 15, 1886. Re-en. July 15, 1886; Corp.; Sergt. Dec. 22, 1886; dis. July 15, 1888. Re-en. July 15, 1888; Sergt; dis. July 15, 1890. Re-en. July 15, 1890; Sergt.; 2d Lieut. Oct. 8, 1890.
COMPANY G.—S. MANCHESTER. *Captain.* Charles L. Bissell, So. Manchester; Nov. 20, 1890.	South Manchester.	30	Harwinton, Conn.	Private Co. G, 1st Regt. C. N. G., Aug. 1, 1882; Corp. Feb. 12, 1883; Sergt. May 28, 1883; 2d Lieut. March 31, 1886; 1st Lieut. Feb. 7, 1887; Capt. Nov. 20, 1890.
First Lieutenant. Charles Cheney, So. Manchester; Nov. 20, 1890.	South Manchester.	25	Hartford, Conn.	Private Co. G, 1st Regt. C. N. G., Nov. 8, 1886; Corp. Jan. 1, 1889; 2d Lieut. Feb. 1, 1889; 1st Lieut. Nov. 20, 1890.
Second Lieutenant. Wesley B. Porter, So. Manchester; Nov. 20, 1890.	South Manchester.	32	Lebanon, Conn.	Private Co. G, 1st Regt. C. N. G., Feb. 22, 1881; Corp. Aug. 7, 1882; dis. June 30, 1884. Re-en. Feb. 18, 1889; Corp. July 1, 1889; 2d Lieut. Nov. 20, 1890.
COMPANY H.—HARTFORD. *Captain.* Charles H. Patterson, Hartford; June 29, 1891.	Hartford.	32	Hartford, Conn.	Private Co. H, 1st Regt. C. N. G., Nov. 22, 1878; Corp. Oct. 7, 1881; Sergt. Aug. 17, 1882; 1st Sergt. May 1, 1883; dis. Nov. 22, 1883. Re-en. Nov. 24, 1883; 1st Sergt.; dis. Nov. 24, 1885. Re-en. Nov. 24, 1885; 1st Sergt.; 2d Lieut. Sept. 14, 1886; 1st Lieut. Jan. 22, 1891; Capt. June 29, 1891.

CONNECTICUT NATIONAL GUARD, FIRST REGIMENT (INFANTRY).— CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
First Lieutenant. William Blevins, Hartford; July 1, 1891.	Hartford.	27	Cambridgp't, Mass.	Private Co. A, 1st Regt. C. N. G., Sept. 6, 1883; Corp. June 1, 1885; Sergt. Nov. 13, 1885; dis. Sept. 6, 1888. Re-en. Sept. 6, 1888; Sergt.; 1st Sergt. Aug. 9, 1889; dis. Sept. 6, 1890. Re-en. Sept. 6, 1890; 1st Sergt.; 1st Lieut. Co. H, 1st Regt. C. N. G., July 1, 1891.	
Second Lieutenant. John Frederick Lehr, Hartford; July 1, 1891.	Hartford.	24	Hartford, Conn.	Private Co. H, 1st Regt. C. N. G., May 1, 1885; Corp. Aug. 5, 1886; Sergt. Mar. 22, 1887; dis. May 1, 1890. Re-en. May 1, 1890; Com'sy Sergt. 1st Regt. C. N. G., May 21, 1890; 2d Lieut. July 1, 1891.	
COMPANY I.—NEW BRITAIN.					
Captain. Charles H. Moore, New Britain; June 23, 1891.	New Britain.	31	New Britain, Conn.	Private Co. I, 1st Regt. C. N. G., Aug. 9, 1890; 1st Lieut. Co. I, 1st Regt. C. N. G., Aug. 15, 1890; Captain June 23, 1891.	
First Lieutenant. Joseph R. Andrews, New Britain; June 23, 1891.	New Britain.	35	New Britain, Conn.	Private Co. I, 1st Regt. C. N. G., Aug. 9, 1890; 2d Lieut. Aug. 15, 1890; 1st Lieut. June 23, 1891.	

Second Lieutenant. Theodore A. Stanley, New Britain; June 23, 1891.	New Britain.	28	New Britain, Conn.	Private Co. I, 1st Regt. C. N. G., Aug. 9, 1890; 1st Sergt. Oct. 7, 1890; 2d Lieut. June 23, 1891.
COMPANY K.—HARTFORD.				
Captain. Charles H. Slocum, Windsor; March 9, 1891.	Hartford.	31	Wallingford, Conn.	Private Co. K, 1st Regt. C. N. G., Feb. 10, 1879; Corp. April 7, 1879; dis. Feb. 10, 1884. Re-en. Feb. 11, 1884; Corp.; dis. Feb. 11, 1886. Re-en. Feb. 12, 1886; Corp.; Sergt. Feb. 12, 1886; dis. Feb. 12, 1888. Re-en. Feb. 13, 1888; Sergt.; 1st Sergt. Feb. 13, 1888; 2d Lieut. July 28, 1888; 1st Lieut. June 24, 1889; Capt. Mar. 9, 1891.
First Lieutenant. Henry H. Saunders, Hartford; March 9, 1891.	Hartford.	33	Hartford, Conn.	Private Co. K, 1st Regt. C. N. G., Feb. 20, 1879; dis. Feb. 20, 1884. Re-en. Feb. 21, 1884; Corp. May 26, 1884; dis. Feb. 21, 1886. Re-en. Feb. 22, 1886; Corp.; dis. Feb. 22, 1888. Re-en. Feb. 27, 1888; Corp.; Sergt. May 7, 1888; 2d Lieut. June 24, 1889; 1st Lieut. Mar. 9, 1891.
Second Lieutenant. Edward H. Waterman, Hartford; March 9, 1891.	Hartford.	35	Hartford, Conn.	Private Co. K, 1st Regt. C. N. G., June 19, 1879; Corp. May 17, 1883; dis. June 19, 1884. Re-en. June 20, 1884; Corp.; Sergt. May 17, 1886; dis. June 20, 1886. Re-en. June 21, 1886; Sergt.; dis. June 21, 1888. Re-en. June 29, 1888; Sergt.; 1st Sergt. July 28, 1888; dis. June 29, 1890. Re-en. June 29, 1890; 1st Sergt.; 2d Lieut. Mar. 9, 1891.

CONNECTICUT NATIONAL GUARD. FIRST REGIMENT (INFANTRY).— CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
FIRST SIGNAL CORPS.— HARTFORD.					
First Lieutenant.					
Howard A. Giddings, Hartford; May 8, 1891.	Hartford.	23	Hartford, Conn.	Private Co. F, 1st Regt. C. N. G., May 23, 1887; trans. to 1st Signal Corps 1st Regt. C. N. G., Sept. 30, 1889; Sergt. Oct. 2, 1889; 1st Lieut. comd'g 1st S. C. 1st Regt. C. N. G., May 8, 1891.	
FIRST MACHINE-GUN PLATOON.— HARTFORD.					
Second Lieutenant.					
Henry Avery, Hartford; June 14, 1886.	Hartford.	41	England.	Private Co. H, 1st Regt. C. N. G., July 31, 1883; Corp. Aug. 25, 1884; Sergt. Feb. 19, 1886; 2d Lieut. comd'g 1st M.-G. Platoon June 14, 1886.	
SECOND REGT.—INFANTRY.					
Colonel.					
John B. Doherty, Waterbury; July 1, 1889.	Waterbury.	38	New Brunswick, Can.	Private Co. A, 2d Regt. C. N. G., Jan. 29, 1872; Corp. Dec. 14, 1874; Sergt. Aug. 17, 1877; dis. April 17, 1879. Re-en. April 17, 1879; Sergt.; 1st Sergt. Aug. 17, 1879; 2d Lieut. May 20, 1880; 1st Lieut. June 2, 1882; Capt. Aug. 1, 1883; Major 2d Regt. C. N. G., Feb. 16, 1885; Lieut.-Col. Jan. 24, 1887; Col. July 1, 1889.	

Lieutenant-Colonel. Frank T. Lee, New Haven; July 1, 1889.	New Haven.	35	Madison, Conn.	Private Co. F, 2d Regt. C. N. G., July 30, 1879; Sergt. Jan., 1881; 1st Sergt. April 12, 1881; 2d Lieut. March 3, 1882; 1st Lieut. Mar. 12, 1883; Capt. May 6, 1885; Maj. 2d Regt. C. N. G., Jan. 24, 1887; Lieut.-Col. July 1, 1889.
Major. Lucien F. Burpee, Waterbury; Feb. 3, 1890.	Waterbury.	36	Rockville, Conn.	Private Co. C (Rockville), 1st Regt. C. N. G., Apr. 10, 1874; Corp. June 15, 1874; dis. Nov. 22, 1878. Second Lieut. Co. A, 2d Regt. C. N. G., March 22, 1886; 1st Lieut. June 21, 1886; Captain June 13, 1887; Major Feb. 3, 1890.
Adjutant.—Captain. Arthur M. Dickinson, Waterbury; July 23, 1889.	Waterbury.	32	Waterbury, Conn.	
Quartermaster.—First Lieutenant. George G. Blakeslee, Waterbury; July 26, 1889.	Waterbury.	30	Cincinnati, Ohio.	
Paymaster.—First Lieutenant. William H. Newton, Wallingford; February 9, 1887.	Wallingford.	41	Newfane, Vt.	
Surgeon.—Major. John M. Benedict, Waterbury; July 23, 1889.	Waterbury.	39	Bethel, Conn.	1st Lieut. and Asst. Surgeon 2d Regt. C. N. G., Aug. 4, 1888. Major and Surgeon, July 23, 1889.
Asst. Surgeon.—First Lieutenant. William G. Daggett, New Haven; July 23, 1889.	New Haven.	31	New Haven, Conn.	

CONNECTICUT NATIONAL GUARD. SECOND REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Inspector of Rifle Practice.—Capt'n. Charles C. Ford, New Haven; July 23, 1889.	New Haven.	34	New Haven, Conn.	Private Co. F, 2d Regt. C. N. G., Feb. 11, 1881; Corp. Jan. 22, 1883; Sergt. Aug. 6, 1883; 1st Sergt. June 8, 1885; dis. Feb. 11, 1886. Re en. Feb. 11, 1886; 1st Sergt.; 2d Lieut. March 11, 1886; 1st Lieut. Jan. 19, 1887; Captain Feb. 16, 1887; res. Sept. 17, 1888. Captain and I. R. P. 2d Regt. C. N. G., July 23, 1889.	
Chaplain. Justin E. Twitchell, New Haven; Sept. 20, 1887.	New Haven.	56	Shelburne, Mass.	Chaplain 5th Regt. Ohio N. G.	Chaplain 131st Regt. Ohio Vols., May 14, 1864.
COMPANY A.—WATERBURY.					
Captain. William E. Moses, Waterbury; June 22, 1891.	Waterbury.	30	Boston, Mass.	Private Co. C, 1st Regt. Mass. V. M., Mar. 19, 1880; dis. Nov., 1882. Private Co. A, Washington (D.C.) Continentals, Aug., 1883; Com'sy-Sergt. Jan., 1884; Sergt.-Major April, 1884; 1st Lieut. and Adjutant May, 1884; res. August, 1885. Private Co. A, 2d Regt. C. N. G., Mar. 2, 1887; Corp. Aug. 12, 1887; 2d Lieut. Jan. 30, 1888; 1st Lieut. Feb. 26, 1890; Captain June 22, 1891.	

First Lieutenant. (Vacancy.)				
Second Lieutenant. Edwin Hart, Waterbury; June 22, 1891.	Waterbury.	22	Newark, N. J.	Private Co. A, 2d Regt. C. N. G., Nov. 9, 1885; Corp. Feb. 26, 1890; dis. Nov. 9, 1890. Re-en. Nov. 10, 1890; Corp.; Sergt. Apr. 6, 1891; 2d Lieut. June 22, 1891.
COMPANY B.—NEW HAVEN. *Captain.* John Gutt, New Haven; May 24, 1886.	New Haven.	36	Newark, N. J.	Private Co. B, 2d Regt. C. N. G., Mar. 1, 1874; Corp. Feb. 18, 1876; Sergt. May 19, 1878; 1st Sergt. July 1, 1878; dis. Mar. 13, 1879 Re-en. Mar. 13, 1879; 1st Sergt.; dis. Mar. 31, 1881. Re-en. Mar. 31, 1881; 1st Sergt.; 2d Lieut. Aug. 10, 1881; 1st Lieut. Nov. 30, 1883; Capt. May 24, 1886.
First Lieutenant. Charles G. Miller, New Haven; February 16, 1887.	New Haven.	36	Springfield, Mass.	Private Co. B, 2d Regt. C. N. G., Jan. 4, 1875; Corp. Jan. 7, 1879; dis. Mar. 12, 1880. Re-en. Mar. 15, 1880; Sergt. Nov. 3, 1880; dis. Mar. 14, 1882. Re-en. Mar. 15, 1882; Sergt.; dis. Mar. 15, 1884. Re-en. Apr. 9, 1884; 1st Sergt. Aug. 20, 1884; dis. April 9, 1886. Re-en. April 10, 1886; 1st Sergt.; 2d Lieut. May 24, 1886; 1st Lieut. Feb. 16, 1887.

CONNECTICUT NATIONAL GUARD. SECOND REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant.					
Laurens Kling, New Haven; April 30, 1890.	New Haven.	33	Apenrade, Denmark.	Private Co. B, 2d Regt. C. N. G., July 7, 1886; Corp. Mar. 30, 1887; Sergt. Mar. 21, 1890; 2d Lieut. April 30, 1890.	
COMPANY C.—NEW HAVEN.					
Captain.					
Michael Creed, New Haven; October 22, 1889.	New Haven.	36	England.	Private Co. C, 2d Regt. C. N. G., April 1, 1874; dis. May 8, 1879. Re-en. May 8, 1879; Corp. May 8, 1879; dis. May 7, 1881. Re-en. May 9, 1881; Sergeant May 10, 1881; dis. May 9, 1883. Re-en. May 16, 1883; 1st Sergt. Sept. 1, 1884; dis. May 16, 1885. Re-en. June 4, 1885; 1st Sergt.; 2d Lieut. Feb. 4, 1886; 1st Lieut. Oct. 20, 1887; Capt. Oct. 22, 1889.	
First Lieutenant.					
James J. Kennedy, New Haven; October 22, 1889.	New Haven.	38	Orange, Conn.	Private Co. C, 2d Regt. C. N. G., Mar. 10, 1874; dis. May 7, 1879. Re-en. May 8, 1879; Corp. May 8, 1879; dis. May 7, 1881. Re-en. May 9, 1881; Corp.; dis. May 9, 1883. Re-en. May 11, 1883; Corp.; Q.M.-Sergt.; Sergt.; dis. May 11, 1885. Re-en. May 14, 1885; Sergt.; dis. May 14, 1887. Re-en. July 23, 1887; 1st Sergt.; 2d Lieut. Oct. 20, 1887; 1st Lieut. Oct. 22, 1889.	

Second Lieutenant.					
James F. Plunkett, New Haven; April 29, 1890.	New Haven.	35	Cavan, Ireland.	Private Co. C, 2d Regt. C. N. G., May 15, 1882; Corp. Nov. 14, 1884; Sergt.; dis. May 15, 1887. Re-en. May 20, 1887; Sergt. May 20, 1887; dis. May 20, 1889. Re-en. June 18, 1889; Sergt.; 1st Sergt. Nov. 19, 1889; 2d Lieut. April 29, 1890.	
COMPANY D.—NEW HAVEN.					
Captain.					
George E. Albee, New Haven; June 23, 1891.	Westville.	47	Lisbon, N. H.		Private Co. G, 1st Regt. Berdan's U. S. Sharpshooters, June 25, 1862; wounded Aug. 30, 1862, 2d Bull Run; dis. Oct. 22, 1862; Private 3d Battery, Wisconsin Light Artillery, Dec. 23, 1863; 2d Lieut. 36th Wis. Vols., Mar. 8, 1864; captured at Reams Station, Aug. 25, 1864; exchanged Dec. 16, 1864. 1st Lieut. Jan. 16, 1865; Brevet 1st Lieut. Vols., Mar. 13, 1865, for gallant and meritorious service during the war. Mustered out July 12, 1865; 2d Lieut. 36th U. S. C. T., Sept. 18, 1865; mustered out Oct. 28, 1866; 2d Lieut. 41st U. S. Inf., 1866; 1st Lieut. Nov. 4, 1867. Trans. to 24th U. S. Inf., Nov. 11, 1869. Placed on retired list U. S. Army June 28, 1878.

CONNECTICUT NATIONAL GUARD. SECOND REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
First Lieutenant. Wallace E. Beach, New Haven; January 30, 1890.	New Haven.	46	Plymouth, Conn.	Private Co. H, 1st Regt. C. N. G., Nov. 11, 1878; Corp.; Sergt.; 1st Sergt.; red., dis. Nov. 19, 1881. Private Co. D, 2d Regt. C. N. G., Aug. 31, 1882; Corp. Apr. 19, 1883; Q.M.-Sergt.; 1st Sergt. 1884; dis. May 4, 1887. Re-en. Oct. 1, 1887; 1st Sergt.; 2d Lieut. March 22, 1888; 1st Lieut. Jan. 30, 1890.	Private Co. D, 2d Regt. Heavy Arty. Conn. Vols., July 22, 1862; wounded June 1, 1864, Cold Harbor, Va.; Corp. Mar. 1, 1865; dis. July 7, 1865.
Second Lieutenant. James C. Twining, New Haven; January 30, 1890.	New Haven.	26	New Haven, Conn.	Private Co. D, 2d Regt. C. N. G., July 26, 1883; Corp. August, 1886; Sergt. June, 1887; dis. July 26, 1888. Re-en. July 26, 1888; Sergt.; 2d Lieut. Jan. 30, 1890.	
COMPANY E.—NEW HAVEN.					
Captain. Frederick L. Lehr, New Haven; June 23, 1891.	New Haven.	27	New Haven, Conn.	Private Co. E, 2d Regt. C. N. G., Jan. 7, 1884; Corp. April, 1885; Sergt. Jan., 1888; dis. Jan. 7, 1889. Re-en. Jan. 7, 1889; Sergt.; 2d Lieut. Mar. 18, 1890; 1st Lieut. Sept. 30, 1890; Capt. June 23, 1891.	

First Lieutenant. Henry S. Hamilton, New Haven; June 23, 1891.	New Haven.	38	New York, N. Y.	Private Co. E, 2d Regt. C. N. G. April 1, 1878; dis. April 1, 1883. Re-en. Apr. 1, 1883; Corp. May, 1883; dis. April 1, 1885. Re en. April 1, 1885; Sergt.; dis. Apr. 1, 1887. Re-en. Apr. 1, 1887; Sergt.; dis. April 1, 1889. Re-en. Apr. 1, 1889; 1st Sergt.; 2d Lieut. Sept. 30, 1890; 1st Lieut. June 23, 1891.	
Second Lieutenant. William H. Coleman, New Haven; June 23, 1891.	New Haven.	27	New Haven, Conn.	Private Co. E, 2d Regt. C. N. G., Apr. 6, 1886; Corp. Aug. 4, 1889; Sergt. Sept. 30, 1890; dis. Apr. 6, 1891. Re-en. Apr. 30, 1891; Sergt.; 2d Lieut. June 23, 1891.	
COMPANY F.—NEW HAVEN.					
Captain. Benjamin E. Brown, New Haven; January 9, 1889.	New Haven.	45	England.	Private Co. F, 2d Regt. C. N. G., Sept. 3, 1866; Corp. 1867; Sergt. 1868; dis. Feb. 27, 1874. Captain Co. F, 2d Regt. C. N. G., Jan. 9, 1889.	Musician Co. E, 27th Regt. Conn. Vol. Infy. Oct. 22, 1862; dis. July 25, 1863, tm. ex.
First Lieutenant. Charles F. McCabe, New Haven; October 27, 1891.	New Haven.	31	Goshen, Conn.	Private Co. F, 2d Regt. C. N. G., Jan. 28, 1884; Corp. June 10, 1885; Sergt. May 9, 1887; dis. Jan. 28, 1889. Re-en. Jan. 28, 1889; Sergt.; 1st Sergt. July 24, 1889; 2d Lieut. June 29, 1891; 1st Lieut. Oct. 27, 1891.	
Second Lieutenant. Clarence B. Dann, New Haven; October 27, 1891.	New Haven.	29	New Haven, Conn.	Private, Co. F, 2d Regt. C. N. G., March 9, 1887; Corp. Dec. 26, 1888; Sergt. Nov. 1, 1890; 2d Lieut. Oct. 27, 1891.	

CONNECTICUT NATIONAL GUARD. SECOND REGIMENT (INFANTRY).— CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
COMPANY G. — WATERBURY.					
Captain.					
Alfred J. Wolff, Waterbury; June 21, 1886.	Waterbury.	35	France.	Private Co. G, 2d Regt. C. N. G., June 7, 1876; Corp. Oct. 4, 1880; dis. June 6, 1881. Re-en. July 20, 1881; Sergt. Sept. 3, 1881; dis. July 20, 1883. Re-en. Jan. 3, 1884; 1st Sergt. March 18, 1884; 2d Lieut. July 1, 1884; Captain June 21, 1886.	
First Lieutenant.					
Daniel E. Fitzpatrick, Waterbury; November 15, 1887.	Waterbury.	30	Waterbury, Conn.	Private Co. G, 2d Regt. C. N. G., July 30, 1883; 2d Lieut. Oct. 19, 1886; 1st Lieut. Nov. 15, 1887.	
Second Lieutenant.					
Patrick Halpin, Waterbury; November 15, 1887.	Waterbury.	26	Waterbury, Conn.	Private Co. G, 2d Regt. C. N. G., Sept. 1, 1885; Q.M.-Sergt. May 3, 1887; 2d Lieut. Nov. 15, 1887.	
COMPANY H.—MIDDLETOWN.					
Captain.					
Wesley U. Pearne, Middletown; March 17, 1885.	Middletown.	40	New York, N. Y.	Private Co. H, 2d Regt. C. N. G., Jan. 12, 1875; dis. June 1, 1876. Restored Aug. 23, 1876; dis. March 12, 1880. Re-en. March 12, 1880; Com.-Sergt. 2d Regt, Apr. 15, 1880; 1st Lieut. Co. H, Jan. 24, 1882; Capt. Mar. 17, 1885.	

First Lieutenant. Benjamin D. Putnam, Middletown; March 17, 1885.	Middletown.	33	Middletown, Conn.	Private Co. H, 2d Regt. C. N. G., May 25, 1878; Corp. Apr. 25, 1880; Sergt. Feb. 7, 1882; 1st Sergt. May 8, 1883; dis. May 25, 1883. Re-en. May 25, 1883; 1st Sergt.; 2d Lieut. Jan. 8, 1884; 1st Lieut. March 17, 1885.
Second Lieutenant. Joseph T. Elliott, Middletown; August 7, 1890.	Middletown.	44	New York, N. Y.	Private Co. H, 2d Regt. C. N. G., Jan. 2, 1873; Corp. Sept. 29, 1873; Sergt. Mar. 9, 1875; dis Feb. 6, 1876. Restored, Aug. 23, 1876; Sergt. Aug. 16, 1877; 2d Lieut. Mar. 23, 1880; Capt. and Adjt. 2d Regt. C. N. G., Mar. 21, 1881; Lieut.-Colonel and A. A.-G. of Brigade C. N. G., Feb. 13, 1885; 2d Lieut. Co. H, 2d Regt. C. N. G., Aug. 7, 1890.
COMPANY I. — MERIDEN. *Captain.* Charles B. Bowen, Meriden; October 20, 1887.	Meriden.	30	Lewistown, Me.	Private Co. I, 2d Regt. C. N. G., May 24, 1881; Q.M.-Sergt. June 26, 1883; 1st Lieut. July 30, 1885; Capt. Oct. 20, 1887.
First Lieutenant. Clemens R. Darnstaedt, Meriden; March 15, 1888.	Meriden.	29	Meriden, Conn.	Private Co. H, 1st Regt. C. N. G., July 12, 1881; Corp. July 31, 1883; trans. to Co. I, 2d Regt. Mar. 21, 1884; Corp. Nov. 17, 1884; Sergt. May 20, 1885; dis. July 12, 1886. Re-en. July 13, 1886; Sergt.; 1st Sergt. Oct. 27, 1887; 1st Lieut. March 15, 1888.
Second Lieutenant. Oscar L. Bradley, Meriden; January 17, 1889.	Meriden.	30	Meriden, Conn.	Private Co. I, 2d Regt. C. N. G., May 3, 1880; Corp.; dis. May 3, 1885. Re-en. June 2, 1885; Corp.; dis. June 2, 1887. Re-en. June 3, 1887; Sergt. April 4, 1888; 2d Lieut. Jan. 17, 1889.

CONNECTICUT NATIONAL GUARD. SECOND REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
COMPANY K.—WALLINGFORD.					
Captain.					
(Vacancy.)					
First Lieutenant. Robert E. Hall, Wallingford; Sept. 18, 1888.	Wallingford.	29	Wallingford, Conn.	Private Co. K, 2d Regt. C. N. G., Feb. 3, 1881; Corp. May 17, 1883; dis. Feb. 3, 1886. Re-en. Feb. 18, 1886; Sergt. Apr. 8, 1886; 1st Sergt. Dec. 31, 1886; 2d Lieut. July 28, 1887; 1st Lieut. Sept. 18, 1888.	
Second Lieutenant. Daniel L. Barber, Wallingford; June 25, 1891.	Wallingford.	37	Litchfield, Conn.	Private Co. E, 1st Regt. C. N. G., Dec. 11, 1875; dis. Aug. 8, 1878. Private Co. K, 2d Regt. C. N. G., Sept. 20, 1883; Corp. May 20, 1885; Sergt. Dec. 30, 1886; dis. Sept. 20, 1888. Re-en. Sept. 20, 1888; 1st Sergt.; dis. Sept. 20, 1890. Re-en. Sept. 20, 1890; 1st Sergt.; 2d Lieut. June 25, 1891.	

SECOND SIGNAL CORPS. — NEW HAVEN.					
First Lieutenant.					
Francis J. Duffy, New Haven; Nov. 4, 1889.	New Haven.	41	New Haven, Conn.	Private Co. C, 2d Regt. C. N. G., Nov. 1, 1870; Corp. June 30, 1873; Sergt. Sept. 1, 1876; dis. May 7, 1879. Re-en. May 8, 1879; Sergt.; dis. May 7, 1881. Re-en. May 9, 1881; Sergt.; dis. May 8, 1883. Re-en. May 11, 1883; Q.M.-Sergt. 2d Regt. C. N. G., August 20, 1883; dis. May 11, 1885. Re-en. Q.M. Sergt. 2d Regt. C. N. G., May 20, 1885; 1st Lieut. and Q. M. June 16, 1886; res. July 26, 1889. 1st Lieut. comd'g 2d Sig. Corps, 2d Regt. C. N. G., Nov. 4, 1889.	
SECOND MACHINE GUN PLATOON. — NEW HAVEN.					
Second Lieutenant.					
William H. Sears, New Haven; July 21, 1886.	New Haven.	34	New Haven, Conn.	Private Co. F, 2d Regt. C. N. G., Nov. 15, 1875; Corp. June 2, 1879; dis. Jan. 12, 1881. 2d Lieut. comd'g 2d M. G. Platoon 2d Regt. C. N. G., July 21, 1886.	
THIRD REGT.—(INFANTRY.)					
Colonel.					
George Haven, New London; July 12, 1886.	NewLondon.	47	New London, Conn.	2d Lieut. Co. D, 3d Regt. C. N. G., July 6, 1865; 1st Lieut. Dec. 1, 1865; Capt. Aug. 10, 1867; Major 3d Regt. C. N. G., Sept. 3, 1870; Lieut.-Col. Apr. 20, 1872; res. April 21, 1873. Captain and Adjt. 3d Regt. C. N. G., Feb. 18, 1879; Major Mar. 20, 1882; Colonel July 12, 1886.	Private Rifle Co. C, 2d Regt. Conn. Vols. (3 mos.), May 7, 1861; dis. Aug. 7, 1861. Private Co. C, 1st Regt. Cav'y Conn. Vols., Nov. 25, 1861; Corp.; dis. Nov. 22, 1864, ex. term service.

CONNECTICUT NATIONAL GUARD. THIRD REGIMENT (Infantry).—Continued.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. Address.	Age.	Birthplace.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Lieutenant-Colonel. Hezekiah B. Smith, New London; June 30, 1891.	New London.	50	New London, Conn.	Private Co. D, 3d Regt. C. N. G., Aug. 31, 1871; Sergt.; Sergt.-Major Aug. 1, 1872; Captain and Adj., April 20, 1875; dis. April 16, 1878. Capt. and Adjt. 3d Regt. C. N. G., July 23, 1883; Lieut.-Colonel June 30, 1891.	Private Co. E, 2d Regt. Conn. Vols. Inf. (3 mos.), May 7, 1861; m. o. Aug. 7, 1861. Private 1st Lt. Batt'y Conn. Vols., Oct. 14, 1861; Sergt. Nov. 26, 1861; Q. M. Sergt. Feb. 15, 1863; 2d Lieut. May 13, 1863; 1st Lieut. June 23, 1864; res. Jan. 30, 1865.
Major. William F. Bidwell, Norwich; July 12, 1886.	Norwich.	35	Norwich, Conn.	First Lieut. Co. C, 3d Regt. C. N. G., May 28, 1878; Capt. Dec. 30, 1880; res. Nov. 14, 1881. Captain Co. C, 3d Regt. C. N. G., Nov. 21, 1881; Major July 12, 1886.	
Adjutant.—Captain. George M. Cole, New London; August 15, 1891.	New London.	38	Portsmouth, Eng.	Private Indiana Legion, Nov., 1882; 1st Sergt.; dis. Private 3d M.-G. Platoon 3d Regt. C. N. G., Feb. 7, 1885; Sergt. Apr. 29, 1885; Com'sy-Sergt. 3d Regt. C. N. G., Aug. 6, 1886; 1st Lieut. and Paymaster Jan. 7, 1887. Captain Co. I, 3d Regt. C. N. G., May 8, 1888; res. Jan. 20, 1891. Captain and Adjt. 3d Regt. C. N. G., Aug. 15, 1891.	

Quartermaster.—First Lieutenant. William E. Pendleton, New London; January 7, 1887.	New London.	38	Mystic, Conn.	Private Co. D, 3d Regt. C. N. G., Sept. 13, 1880; Corp. Aug. 22, 1881; Sergt. Aug. 22, 1883; dis. Sept. 13, 1885. Re-en. Oct. 12, 1885; 1st Sergt. Sept. 6, 1886; 1st Lieut. and Q.M. 3d Regt. C. N. G., Jan. 7, 1887.	
Paymaster.—First Lieutenant. Frederick Farnsworth, New London; June 15, 1890.	New London.	49	Norwich, Conn.		
Surgeon.—Major. Leonard B. Almy, Norwich; July 22, 1886.	Norwich.	40	Norwich, Conn.		
Assistant Surgeon.—First Lieut. Julian LaPierre, Norwich; July 24, 1890.	Norwich.	47	Norwich, Conn.		
Inspector of Rifle Practice.—Capt. Thomas H. Allen, Sprague; July 21, 1887.	Sprague.	29	Sprague, Conn.	Private Co. C, 3d Regt. C. N. G., Sept. 3, 1883; Sergt.; 1st Lieut. and S. O. 3d Regt. Aug. 11, 1885; Captain and I. R. P., July 21, 1887.	
Chaplain. Nicholas T. Allen, Groton; November 1, 1886.	Groton.	71	N. Kingston, R. I.	....	Chaplain 26th Regt. Conn. Vols., Sept. 26, 1862; dis. April 2, 1863.
COMPANY A.—NEW LONDON. *Captain.* Michael J. Roach, New London; June 8, 1887.	New London.	40	Norwich, Conn.	Private Co. E, 3d Regt. C. N. G., Aug. 28, 1871; Corp. July 9, 1872; Sergt. May 17, 1876; dis. Dec. 21, 1876. Re-en. May 12, 1878; Sergt.; 1st Sergt.; 2d Lieut. April 10, 1882; Captain June 8, 1887.	

CONNECTICUT NATIONAL GUARD. THIRD REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE. RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
First Lieutenant. Henry S. Dorsey, New London; January 28, 1891.	New London.	26	New London, Conn.	Private Co. A, 3d Regt. C. N. G., Nov. 8, 1886; trans. to 3d Sig. Corps, 3d Regt. C. N. G., May 12, 1890; 2d Lieut. Co. A, 3d Regt. C. N. G., July 23, 1890; 1st Lieut. Jan. 28, 1891.	
Second Lieutenant. Jeremiah Dillon, New London; January 28, 1891.	New London.	27	New London, Conn.	Private Co. A, 3d Regt. C. N. G., Nov. 30, 1886; Corp. July 19, 1887; Sergt. Feb. 5, 1890; 2d Lieut. Jan. 28, 1891.	
COMPANY B.—PAWCATUCK.					
Captain. Daniel Keleher, Stonington; July 28, 1886.	Westerly, R. I.	40	Ireland.	Private Co. B, 3d Regt. C. N. G., Mar. 4, 1875; Sergt.; 2d Lieut. March 23, 1876; res. Aug. 9, 1876. Private Co. B, 3d Regt. C. N. G., Dec. 28, 1877; Sergt.; 2d Lieut. Aug. 18, 1879; 1st Lieut. May 16, 1882; Capt. July 28, 1886.	
First Lieutenant. Cornelius Bransfield, Stonington; July 28, 1886.	Westerly, R. I.	35	Stonington, Conn.	Private Co. B, 3d Regt. C. N. G., April 4, 1878; Corp.; 2d Lieut. May 16, 1882; 1st Lieut. July 28, 1886.	
Second Lieutenant. Walter Fitzgerald, Stonington; May 31, 1889.	Westerly, R. I.	31	Stonington, Conn.	Private Co. B, 3d Regt. C. N. G., June 7, 1883; Corp. March 10, 1887; dis. June 7, 1888. Re-en. June 7, 1888; Corp.; Sergt. Feb. 5, 1889; 2d Lieut. May 31, 1889.	

COMPANY C.—NORWICH.				
Captain.				
Fred A. Fox, Norwich; April 29, 1890.	Norwich.	33	East Lyme, Conn.	Private Co. C, 3d Regt. C. N. G., Dec. 13, 1880; Corp. Feb. 18, 1882; Sergt. July 14, 1885; dis. Dec. 13, 1885. Re-en. Dec. 13, 1885; Sergt.; 2d Lieut. Jan. 18, 1887; 1st Lieut. Feb. 21, 1888; res. Nov. 30, 1889; Capt. Apr. 29, 1890.
First Lieutenant.				
Arthur S. Howard, Norwich; December 10, 1889.	Norwich.	33	Union, Conn.	Private Co. C, 3d Regt. C. N. G., Nov. 8, 1883; Corp. Nov. 24, 1886; Sergt. Aug. 2, 1887; dis. Nov. 8, 1888. Re-en. Feb. 5, 1889; Corp. Aug. 9, 1889; 1st Lieut. Dec. 10, 1889.
Second Lieutenant. (Vacancy.)				
COMPANY D.—NEW LONDON.				
Captain.				
Thomas O. Thompson, New London; February 9, 1891.	New London.	28	New York, N. Y.	Private Co. I, 3d Regt. C. N. G., May 17, 1881; Corp. May 23, 1882; 1st Lieut. and Signal Officer 3d Regt. July 23, 1883; Capt. and I. R. P., Mar. 12, 1885; res. July 19, 1886. Enlisted Co. F, 7th Regt. N. G. S. N. Y., April 30, 1886; dropped Oct. 7, 1890. 1st Lieut. Co. D, 3d Regt. C. N. G., Dec 1, 1890; Capt. Feb. 9, 1891.

CONNECTICUT NATIONAL GUARD. THIRD REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
First Lieutenant.					
David Conner, New London; March 4, 1891.	New London.	30	Brooklyn, N. Y.	Private Co. D, 3d Regt. C. N. G., Nov. 22, 1880; Corp. Aug. 22, 1881; Sergt. May 8, 1882; Sergt.-Major 3d Regt. C. N. G., July 10, 1883; dis. Nov. 22, 1885. Re-en. Sergt. Major Nov. 23, 1885; dis. Nov. 23, 1887. Re-en. Sergt.-Major Nov. 23, 1887; dis. Nov. 23, 1889. Re-en. Sergt.-Major Nov. 23, 1889; 1st Lieut. Co. D, 3d Regt. C. N. G., March 4, 1891.	
Second Lieutenant. (Vacancy.)					
COMPANY E.—WILLIMANTIC.					
Captain.					
John H. Morrison, Windham; April 22, 1889.	Willimantic.	29	Windham, Conn.	Private Co. E, 3d Regt. C. N. G., May 15, 1883; Corp. Sept. 10, 1883; Sergt. Aug. 21, 1884; 2d Lieut. May 17, 1886; Capt. April 22, 1889.	
First Lieutenant.					
Martin Heffernan, Willimantic; June 11, 1889.	Willimantic.	26	Windham, Conn.	Private Co. E, 3d Regt. C. N. G., July 24, 1884; Corp. Apr. 15, 1886; Sergt. Feb. 12, 1887; 1st Sergt. Aug. 1, 1888; 2d Lieut. April 22, 1889; 1st Lieut. June 11, 1889.	

Second Lieutenant. James T. Lynch, Willimantic; June 11, 1889.	Willimantic.	31	Windham, Conn.	Private Co. E, 3d Regt. C. N. G., May 9, 1889; 2d Lieut. June 11, 1889.
COMPANY F.—DANIELSONVILLE. *Captain.*				
John Armstrong, Killingly; Sept. 20, 1887.	Danielsonville.	31	England.	Private Co. F, 3d Regt. C. N. G., Dec. 15, 1885; 2d Lieut. April 1, 1886; 1st Lieut. June 3, 1886; Capt. Sept. 20, 1887.
First Lieutenant. Henry E. Burton, Danielsonville; Oct. 13, 1891.	Danielsonville.	28	St. Albans, Vt.	Private Co. F, 3d Regt. C. N. G., April 8, 1886; Corp. Apr. 1, 1887; 2d Lieut. Nov. 15, 1887; 1st Lieut. Oct. 13, 1891.
Second Lieutenant. Frank E. Warren, Danielsonville; Oct. 13, 1891.	Danielsonville.	28	Killingly, Conn.	Musician Co. F, 3d Regt. C. N. G., Apr. 8, 1886; dis. April 8, 1891. 2d Lieut. Oct. 13, 1891.
COMPANY G.—PUTNAM. *Captain.*				
Henry J. Thayer, Putnam; December 11, 1890.	Putnam.	37	Woonsocket, R. I.	Private Co. A, 4th Battn. Inf. 2d Brig. R. I. M., May 27, 1875; Sergt.; 1st Sergt.; 2d Lieut. Nov. 26, 1877; dis. May 1, 1879. Private Co. G, 3d Regt. C. N. G., Aug. 15, 1884; 1st Sergt. May 15, 1885; 2d Lieut. July 27, 1888; 1st Lieut. Feb. 6, 1890; Capt. Dec. 11, 1890.
First Lieutenant. Lucius H. Fuller, Putnam; December 11, 1890.	Putnam.	42	Tolland, Conn.	

CONNECTICUT NATIONAL GUARD. THIRD REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant.					
Clinton A. Winslow, Putnam; June 4, 1891.	Putnam.	43	Putnam, Conn.	Private Co. G, 3d Regt. C. N. G., Jan. 11, 1872; Corp.; 2d Lieut. Aug. 22, 1876; 1st Lieut. Aug. 30, 1877; Capt. April 3, 1878; res. May 2, 1879. 2d Lieut. Co. G, 3d Regt. C. N. G., Mar. 18, 1881; res. Aug. 17, 1881. 2d Lieut. Co. G, 3d Regt. C. N. G., Apr. 5, 1883; Capt. Nov. 15, 1883; res. Jan. 29, 1890. 2d Lieut. June 4, 1891.	
COMPANY I.—NEW LONDON.					
Captain.					
George W. Metcalf, New London; June 9, 1891.	New London.	42	New London, Conn.	Private Co. D, 3d Regt. C. N. G., Aug. 8, 1865; dis. Sept. 18, 1871. Private Co. I, 3d Regt. C. N. G., Jan. 14, 1879; Corp. May 18, 1881; dis. Jan. 14, 1884. Re-en. Jan. 14, 1884; Sergt.; dis. Jan. 14, 1886. Re-en. Jan. 14, 1886; 1st Sergt. Aug. 27, 1886; dis. Jan. 14, 1888. Re-en. Jan. 14, 1888; 1st Sergt.; 1st Lieut. May 8, 1888; Capt. Jan. 27, 1891; appointment revoked, and discharged, May 26, 1891. Capt. June 9, 1891.	
First Lieutenant.					
Samuel Prince, New London; Jan. 27, 1891.	New London.	41	England.	Private Co, I, 3d Regt. C. N. G., Aug. 12, 1879; Corp.; dis. Aug. 12, 1884. Re-en. Aug. 26, 1884; Corp.; 2d Lieut. Aug. 10, 1886; 1st Lieut. Jan. 27, 1891.	

Second Lieutenant. Charles A. Miner, New London; Jan. 27, 1891.	New London.	33	Mystic, Conn.	Private Co. I, 3d Regt. C. N. G., Jan. 8, 1879; Corp. Aug. 26, 1879; Sergt Mar. 3, 1881; dis. July 31, 1883. Re-en. Mar. 2, 1886; Corp. Aug. 27, 1886; Sergt. Dec. 23, 1886; 1st Sergt. June 9, 1888; 2d Lieut. Jan. 27, 1891.	
THIRD SIGNAL CORPS.—NEW LONDON.					
First Lieutenant. Albert C. Ghyser, New London; Oct. 15, 1889.	New London.	28	Germany.	Private Co. I, 3d Regt. C. N. G., Feb. 23, 1886; 1st Lieut. comd'g 3d Signal Corps, Oct. 15, 1889.	U. S. Navy, Jan., 1879; dis. Oct. 1, 1881.
THIRD MACHINE GUN PLATOON.—NEW LONDON.					
Second Lieutenant. Henry L. Starr, New London; Nov. 12, 1890.	New London.	25	Groton, Conn.	Private 3d M.-G. Platoon, 3d Regt. C. N. G., Sept. 17, 1888; dis. Oct. 31, 1890. 2d Lieut. comd'g 3d M.-G. Platoon, Nov. 12, 1890.	
FOURTH REG'T—(INFANTRY).					
Colonel. Henry Skinner, Winchester; March 22, 1890.	W. Winsted.	47	Winchester, Conn.	Capt. Co. I, 4th Regt. C. N. G., Feb. 17, 1872; Major 4th Regt. April 6, 1877; Lieut.-Col. Oct. 12, 1878; Colonel Mar. 22, 1890.	Private Co. E, 2d Regt. Heavy Art. Conn. Vols., July 26, 1862; Sergeant August, 1862; 2d Lieut. Co. M, March 29, 1864; 1st Lieut. Co. G, Aug. 22, 1864; captured Oct. 19, 1864, Cedar Creek, Va.; Capt. Co. B, April 13, 1865; M. o. August 18, 1865.

CONNECTICUT NATIONAL GUARD. FOURTH REGIMENT.—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Lieutenant-Colonel.					
James C. Crowe, Norwalk; March 22, 1890.	So. Norwalk.	56	Norwalk, Conn.	Private Co. A, 8th Regt. C. M., Jan. 1, 1854; 2d Corp. Dec. 30, 1856; 1st Corp. May 10, 1859; dis. 1861. Private Co. D, 8th Regt. C. M., Jan. 1862; 2d Sergt. Jan. 31, 1862; 1st Sergt. Feb. 22, 1864; 2d Lieut. April 24, 1865; 1st Lieut. May 21, 1866 (changed to Co. D, 4th Regt. C. N. G., Aug. 1, 1871); Capt. July 19, 1871; Maj. 4th Regt. Aug. 18, 1880; Lieut.-Colonel Mar. 22, 1890.	
Major.					
George W. Cornell, Bridgeport; March 22, 1890.	Bridgeport.	42	Sing Sing, N. Y.	Private Co. B, 8th Regt. C. N. G., Dec. 18, 1865; Corp. April 2, 1867; 1st Sergt.; dis. Jan. 30, 1871. Re-en. Mar. 1, 1871; Sergt. (changed to Co. B, 4th Regt., Aug. 1, 1871); 2d Lieut. Aug. 11, 1874; 1st Lieut. Nov. 21, 1876; Capt. July 13, 1880; Major Mar. 22, 1890.	

Adjutant.—Captain. Edward Finn, West Winsted; May 28, 1891.	W. Winsted.	46	Ireland.	Private Co. I, 4th Regt. C. N. G., Feb. 6, 1872; Corp.; Sergt. Jan. 8, 1873; dis. May 6, 1877. Re-en. June 7, 1877; 1st Sergt. Aug. 10, 1877; 2d Lieut. Jan. 29, 1879; 1st Lieut. April 5, 1880; Capt. May 20, 1881; resig'd Jan. 30, 1884; Capt. Co. I, 4th Regt. C. N. G., Aug. 20, 1884; resigned Feb. 8, 1889; Capt. and I. R. P. 4th Regt. C. N. G., July 24, 1890. Capt. and Adjutant 4th Regt. C. N. G., May 28, 1891.
Quartermaster.—First Lieutenant. Wilbur F. Coe, West Winsted; May 10, 1890.	W. Winsted.	47	W. Winsted, Conn.	Private Co. I, 4th Regt. C. N. G., Feb 6, 1872; 2d Lieut. Feb. 17, 1872; 1st Lieut. May 7, 1877; Colonel and A. D. C. to Commander-in-Chief Jan. 10, 1879; 1st Lieut. and Quartermaster 4th Regt. C. N. G., May 10, 1890.
Paymaster.—First Lieutenant. Edmund E. Crowe, South Norwalk; May 22, 1890.	So. Norwalk.	28	Norwalk, Conn.	
Surgeon.—Major. Charles C. Godfrey, Bridgeport; May 8, 1890.	Bridgeport.	37	Saybrook, Conn.	Private Co. C, 4th Regt. C. N. G., Sept. 11, 1884; dis. by disbandment of Co. Dec. 19, 1884. Major and Surgeon 4th Regt. C. N. G., May 8, 1890.
Assistant Surgeon.—First Lieut. Wilbur S. Watson, Danbury; July 24, 1890.	Danbury.	39	N. Hartford, Conn.	

CONNECTICUT NATIONAL GUARD. FOURTH REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Inspector of Rifle Practice.—Capt. Joseph D. Goulden, Stamford; July 6, 1891.	Stamford.	32	Fairfield, Conn.	Private Co. C, 4th Regt. C. N. G., Nov. 11, 1889; Capt. and I. R. P. 4th Regt. C. N. G., July 6, 1891.	
Chaplain. Beverly E. Warner, Bridgeport; July 3, 1889.	Bridgeport.	36	Jersey City, N. J.		
COMPANY B.—BRIDGEPORT.					
Captain. Garrie P. Sanger, Bridgeport; April 15, 1890.	Bridgeport.	32	Bridgeport, Conn.	Private Co. B, 4th Regt. C. N. G., Aug. 5, 1879; Corp. Mar. 15, 1881; Sergt. May 1, 1883; dis. Aug. 5, 1884. Re-en. Aug. 5, 1884; Sergt.; 1st Sergt. Nov. 17, 1885; dis. Aug. 5, 1886. Re-en. Aug. 5, 1886; 1st Sergt.; 2d Lieut. Feb. 8, 1887; 1st Lieut. Dec. 10, 1889; Capt. April 15, 1890.	
First Lieutenant. Francis V. Gilhuley, Bridgeport; April 15, 1890.	Bridgeport.	27	Bridgeport, Conn.	Private Co. B, 4th Regt. C. N. G., Apr. 12, 1882; Corp. Aug. 28, 1883; Sergt. July 27, 1886; dis. Apr. 12, 1887. Re-en. April 13, 1887; Sergt. April 13, 1887; 1st Sergt. Feb. 15, 1889; dis. April 13, 1889. Re-en. Apr. 13, 1889; 1st Sergt. April 13, 1889; 2d Lieut. Dec. 10, 1889; 1st Lieut. April 15, 1890.	

Second Lieutenant. Merritt F. White, Bridgeport; June 3, 1890.	Bridgeport.	35	Barre, Mass.	Private Co. B, 4th Regt. C. N. G., Feb. 18, 1884; Corp. Nov. 17, 1885; Sergt April 17, 1888; dis. Feb. 18, 1889. Re-en. Feb. 18, 1889; Sergt.; 2d Lieut. June 3, 1890.
COMPANY C.—STAMFORD.				
Captain. Charles W. Hendrie, Stamford; July 20, 1891.	Stamford.	29	Greenwich, Conn.	Private Co. C, 4th Regt. C. N. G., Apr. 29, 1886; Q. M.-Sergt. Dec. 27, 1889; 2d Lieut. June 27, 1890; Capt. July 20, 1891.
First Lieutenant. Francis E. Alden, Stamford; August 24, 1891.	Stamford.	22	Chicopee, Mass	Private Co. C, 4th Regt. C. N. G, May 20, 1889; Corp. May 26, 1890; 2d Lieut. July 20, 1891; 1st Lieut. Aug. 24, 1891.
Second Lieutenant. Gilbert L Fitch, Noroton, August 24, 1891.	Noroton.	22	Corfu, N. Y.	Private Co. C, 4th Regt. C. N. G., Nov. 19, 1888; Corp. Aug. 3, 1891; 2d Lieut. Aug. 24, 1891.
COMPANY D.—SO. NORWALK.				
Captain. Russell Frost, Norwalk; February 17, 1886.	So. Norwalk.	41	Troy, N. Y. .	First Lieut. Co. D, 4th Regt. C. N. G, Jan. 12, 1886; Capt. Feb. 17, 1886.
First Lieutenant. George E. Simpson, Norwalk; March 8, 1889.	So. Norwalk.	32	Branford, Conn.	Private Co. D, 4th Regt. C. N. G., July 27, 1883; Sergt. April 10, 1886; 1st Sergt. Sept. 3, 1886; 2d Lieut. June 22, 1888; 1st Lieut. Mar. 8, 1889.

CONNECTICUT NATIONAL GUARD. FOURTH REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant. Charles H. Oakes, So. Norwalk; March 8, 1889.	So. Norwalk.	26	Ansonia, Conn.	Private Co. D, 4th Regt. C. N. G., Apr. 25, 1884; Corp. Aug. 18, 1885; Sergt. Apr. 10, 1886; 1st Sergt. June 9, 1888; 2d Lieut. Mar. 8, 1889.	
COMPANY E.—BRIDGEPORT.					
Captain. James Sheridan, Bridgeport; December 31, 1880.	Bridgeport.	42	Ireland.	Private Co. E, 8th Regt. C. N. G., Aug. 11, 1868; Corp.; Sergt., 1869; 2d Lieut. Jan. 20, 1871 (changed to Co. E, 4th Regt. Aug. 1, 1871); 1st Lieut. May 30, 1874; res. Feb. 11, 1879. 1st Lieut. Co. E, 4th Regt. C. N. G., Feb. 24, 1879; Capt. Dec. 31, 1880.	
First Lieutenant. John J. Glennon, Bridgeport; May 3, 1888.	Bridgeport.	40	Redding, Conn.	Private Co. E, 4th Regt. C. N. G., Feb. 7, 1876; Corp. Aug. 21, 1877; Sergt. Aug. 19, 1880; dis. March 17, 1881. Re-en. March 21, 1881; Sergt.; 2d Lieut. Mar. 25, 1881; 1st Lieut. May 3, 1888.	
Second Lieutenant. John O'Niel, Bridgeport; July 16, 1888.	Bridgeport.	35	Clinton, Mass.	Private Co. E, 4th Regt. C. N. G., Apr. 2, 1880; Corp. Feb. 25, 1882; dis. April 2, 1885. Re-en. April 6, 1885; Corp.; Sergt. Sept., 1885; dis. April 6, 1887. Re-en. May 9, 1887; Sergt.; 2d Lieut. July 16, 1888.	

COMPANY F.—NORWALK.					
Captain. Reuben M. Rose, Norwalk; Nov. 4, 1890.	Norwalk.	43	Essex, Ohio.		Private Co. H, 61st Ohio Vols. Inf. Feb. 17, 1862; dis. July 24, 1865.
First Lieutenant. Edward G. Aiken, Norwalk; August 11, 1891.	Norwalk.	28	Norwalk, Conn.	Private Co. F, 4th Regt. C. N. G., July 28, 1885; Corp. Aug. 3, 1886; Sergt. Oct. 18, 1887; dis. July 28, 1890. Re-en. Aug. 1, 1890; Sergt.; 2d Lieut. July 29, 1890; 1st Lieut. Aug. 11, 1891.	
Second Lieutenant. Albert J. Wilcoxson, Norwalk; August 11, 1891.	Norwalk.	30	Bridgeport, Conn.	Private Co. F, 4th Regt. C. N. G., June 9, 1883; Corp. May 16, 1885; Sergt. Feb. 27, 1886; dis. June 9, 1888. Re-en. June 9, 1888; 1st Sergt. April 2, 1890; dis. June 9, 1890. Re-en. June 9, 1890; 1st Sergt.; 2d Lieut. Aug. 11, 1891.	
COMPANY G.—DANBURY.					
Captain. Carroll D. Ryder, Danbury; March 31, 1891.	Danbury.	25	Bethel, Conn.	Private Co. G, 4th Regt. C. N. G., Aug. 9, 1887; 1st Sergt. Aug. 10, 1887; 2d Lieut. May 15, 1888; 1st Lieut. May 20, 1890; Capt. Mar. 31, 1891.	
First Lieutenant. Herman M. Eriksson, Danbury; March 31, 1891.	Danbury.	27	Stockholm, Sweden.	Private Co. G, 4th Regt. C. N. G., Mar. 3, 1885; Corp. Mar. 22, 1886; Q. M.-Sergt. Aug. 16, 1886; 1st Sergt. June 30, 1888; dis. Mar. 3, 1890. Re-en Mar. 3, 1890; 1st Sergt.; 1st Lieut. Mar. 31, 1891.	

CONNECTICUT NATIONAL GUARD. FOURTH REGIMENT (INFANTRY).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant.					
John V. Scofield, Danbury; May 20, 1890.	Danbury.	35	Norwalk, Conn.	Private Co. G, 4th Regt. C. N. G., July 10, 1883; Corp. Aug. 10, 1885; Sergt. Aug. 16, 1886; dis. July 10, 1888. Re-en. July 10, 1888; Sergt.; 2d Lieut. May 20, 1890.	
COMPANY I.—WEST WINSTED.					
Captain.					
Henry S. Terrell, Winchester; Nov. 18, 1889.	Winsted.	27	Colebrook, Conn.	Private Co. I, 4th Regt. C. N. G., Apr. 10, 1884; Corp. July 16, 1885; Sergt Jan. 17, 1887; 1st Sergt.; 2d Lieut. Dec. 31, 1888; 1st Lieut. April 8, 1889; Capt. Nov. 18, 1889.	
First Lieutenant.					
Charles N. Parsons, Winchester; Sept. 29, 1890.	Winsted.	23	Winsted, Conn.	Private Co. I, 4th Regt. C. N. G., Mar. 21, 1887; Corp. May 1, 1890; 1st Lieut. Sept. 29, 1890.	
Second Lieutenant.					
William Maxwell, Winchester; Sept. 29, 1890.	Winsted.	31	Scotland.	Private Co. I, 4th Regt. C. N. G., May 4, 1885; Corp.; Sergt.; dis. May 4, 1890. Re-en. May 5, 1890; Sergt.; Q.-M. Sergt.; 2d Lieut. Sept. 29, 1890.	
COMPANY K.—STRATFORD.					
Captain.					
George T. Jewell, Stratford; March 19, 1891.	Stratford.	27	Stratford, Conn.	Private Co. K, 4th Regt. C. N. G., May 19, 1885; Corp. Aug., 1886; 2d Lieut. Apr. 26, 1887; 1st Lieut. Jan. 23, 1890; Capt. Mar. 19, 1891.	

First Lieutenant.				
William H. Fryer, Stratford; October 8, 1891.	Stratford.	34	South Oyster Bay, N. Y.	Private Co. K, 4th Regt. C. N. G., Feb. 22, 1876; dis. Mar. 17, 1881. Re-en. May 7, 1881; Corp.; Sergt. May 20, 1882; dis. May 7, 1883. Re en. May 16, 1883; dis. May 16, 1885. Re-en. June 2, 1885; Sergt. July 7, 1885; dis. June 2, 1887. Re-en. Jan. 16, 1890; 1st Sergt. Feb. 12, 1890; 2d Lieut. Mar. 19, 1891; 1st Lieut. Oct. 8, 1891.
Second Lieutenant.				
William F. Holmes, Stratford; October 8, 1891.	Stratford.	26	Stratford, Conn.	Private Co. K, 4th Regt. C. N. G, June 9, 1885; Corp. Aug. 9, 1887; dis. June 9, 1890. Re en. June 17, 1890; Sergt. July 29, 1890; 2d Lieut. Oct. 8, 1891.
FOURTH SIGNAL CORPS.— BRIDGEPORT.				
First Lieutenant.				
Owen Burns, Bridgeport; May 11, 1891.	Bridgeport.	37	Bridgeport, Conn.	Private Co. E, 4th Regt., C. N. G., Mar. 13, 1880; dis. Mar. 12, 1885. Re-en. Aug. 4, 1887; dis. Aug. 4, 1889. Re-en. 4th Signal Corps, 4th Regt. C. N. G., Oct. 30, 1889; Sergt. April 30, 1890; 1st Lieut. comd'g 1st Signal Corps, 1st Regt. C. N. G., May 11, 1891.

CONNECTICUT NATIONAL GUARD. SEPARATE COMPANIES (INFANTRY, COLORED).

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
FOURTH MACHINE-GUN PLATOON.—BRIDGEPORT.					
Second Lieutenant.					
George P. Rand, Bridgeport; October 26, 1888.	Bridgeport.	37	Boston, Mass.	Private Co. B, 4th Regt. C. N. G., Dec. 10, 1872; Corp. Jan. 29, 1874; Sergt. Dec. 19, 1876; dis. Feb. 6, 1878. Re-en. June 3, 1879; Corp. Aug. 17, 1880; dis. June 2, 1881. Re-en. July 5, 1881; Corp. July 12, 1881; Sergt. Jan. 31, 1882; dis. Oct. 1, 1883. Re-en. Oct. 1, 1883; Sergt. Nov. 13, 1883; 1st Sergt. Nov. 30, 1884; dis. Oct. 1, 1885. 2d Lieut. comd'g 4th M.-G. Platoon 4th Regt. C. N. G., Oct. 26, 1888.	
FIRST SEPARATE COMPANY.—NEW HAVEN.					
Captain.					
Daniel S. Lathrop, Birmingham; April 28, 1884.	Birmingham.	45	New Haven, Conn.	Private Co. A, 5th Battalion C. N. G., Jan. 4, 1881; Capt. April 28, 1884.	Private Co. A, 29th Regt. Conn. Vols. (col'd) Nov. 18, 1863; Sergt. Dec., 1863; 1st Sergt. Jan., 1864; Regimental Q. M.-Sergt. March 20, 1864; dis. Nov. 25, 1865.

First Lieutenant. Daniel Tilghman, New Haven; May 1, 1885.	New Haven.	42	Boston, Mass.	Private Co. A, Ind'p't Bat'l'n C. N. G., May 14, 1879; Corp. May 17, 1879 (changed to 5th Bat'l'n Feb. 26, 1880); Sergt. Nov. 22, 1881; 2d Lieut. April 28, 1884; 1st Lieut. May 1, 1885.
Second Lieutenant. Lewis P. Wood, New Haven; June 14, 1889.	New Haven.	28	Norwalk, Conn.	Private Co. A, 5th Battalion C. N. G., Aug. 5, 1884; Corp. May 16, 1888; Sergt. Dec. 29, 1888; 2d Lieut. June 14, 1889.
SECOND SEPARATE COMPANY.—HARTFORD.				
Captain. Everett W. Freeman, Hartford; August 11, 1890.	Hartford.	29	Hartford, Conn.	Private Co. B, 5th Battalion C. N. G., April 11, 1887; 1st Sergt. Feb. 22, 1888; 1st Lieut. Mar. 4, 1889; (changed to Second Separate Company C. N. G., Mar. 1, 1890); Capt. Aug. 11, 1890.
First Lieutenant. Watkins W. Christian, Hartford; Aug. 11, 1890.	Hartford.	25	Richmond, Va.	Private Co. B, 5th Battalion C. N. G., July 20, 1885; Musc.; Corp. Dec. 19, 1888; 1st Sergt. Mar. 27, 1889; (changed to Second Separate Company, C. N. G., Mar. 1, 1890); dis. July 20, 1890. Re en. Aug. 1, 1890; 1st Lieut. Aug. 11, 1890.

CONNECTICUT NATIONAL GUARD. SEPARATE COMPANIES (INFANTRY, COLORED).—CONTINUED.

ORGANIZATION, NAME, RESIDENCE, RANK, AND DATE OF RANK.	P. O. ADDRESS.	AGE.	BIRTHPLACE.	SERVICE.	
				In National Guard or Militia of this or any other State.	In U. S. Army or Navy.
Second Lieutenant.					
Albert E. Smith, Hartford; May 8, 1891.	Hartford.	52	Annapolis, Md.	Private Co. B, 6th Battalion R. I. M., Aug. 14, 1867; Corp. Nov. 13, 1867; Sergt. Apr. 2, 1868; 1st Sergt. May 20, 1868; 2d Lieut. May 13, 1871; 1st Lieut. May 13, 1872; Adjt. June 3, 1872; 1st Lieut. May 11, 1874; Adjt. June 10, 1874; Lieut.-Col. May 10, 1875; Major 4th Battalion R. I. M., June 16, 1879. Private Co. B, 5th Battalion C. N. G., May 19, 1884; Corpl. Sept. 12, 1885; Sergt. May 15, 1886; dis. May 19, 1889. Re-en. May 20, 1889; Sergt.; 1st Sergt.; (changed to Second Separate Company, C. N. G., Mar. 1, 1890); 2d Lieut. May 8, 1891.	Private Co. D, 41st Pa., Mar. 20, 1865; Regt. Q. M. Sept. 8, 1865; dis. Dec. 13, 1865.
JUDGE ADVOCATES.					
FIRST REGIMENTAL DISTRICT.					
Major Lyman S. Burr, New Britain; June 15, 1891.	New Britain.	38	Torrington, Conn.	Private Co. I, 1st Regt. C. N. G., Aug. 9, 1890; Capt. Aug. 15, 1890. Major and Judge Advocate 1st Regt'l district, June 15, 1891.	

SECOND REGIMENTAL DISTRICT. Major H. Lynde Harrison, New Haven; June 18, 1872.	New Haven	53	New Haven, Conn.	First Lieut. and Paymaster 2d Regt. C. N. G., Aug 18, 1865; Capt. and A.-D.-C. 2d Brig. C. N. G., July 2, 1866; dis. Aug. 1, 1871. Major and Judge Advocate 2d Regt'l district, June 18, 1872.	Regimental Quartermaster 27th Regt. Conn. Vols. Oct. 22, 1862; res. Jan. 20, 1863.
THIRD REGIMENTAL DISTRICT. (Vacancy.)					
FOURTH REGIMENTAL DISTRICT. Major Samuel Fessenden, Stamford; August 30, 1872.	Stamford.	44	Rockland, Me.		

[2.]

MILITARY ENROLLMENT, FALL 1890.

HARTFORD COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Hartford, . .	7,889	2,228	7,711	5,661
Avon, . . .	79	7	76	72
Berlin, . . .	292	40	286	252
Bloomfield, . .	171	40	167	131
Bristol, . . .	1,161	308	1,138	853
Burlington, . .	182	37	171	145
Canton, . .	286	60	274	226
East Granby, .	53	....	53	53
East Hartford, .	479	108	471	371
East Windsor, .	277	26	277	251
Enfield, . . .	755	149	749	606
Farmington, . .	423	124	397	299
Glastonbury, . .	356	67	327	289
Granby, . .	202	39	192	163
Hartland, . .	87	12	87	75
Manchester, . .	683	124	661	559
Marlborough, .	28	6	28	22
New Britain, . .	2,487	657	2,384	1,830
Newington, . .	106	34	97	72
Plainville, . .	301	103	278	198
Rocky Hill, . .	121	16	119	105
Simsbury, . .	260	68	245	192
Southington, . .	825	311	784	514
South Windsor, .	270	58	266	212
Suffield, . .	296	27	290	269
West Hartford, .	155	35	154	120
Wethersfield, .	215	90	209	125
Windsor, . .	388	110	388	278
Windsor Locks, .	454	118	434	336
Total, . .	19,281	5,002	18,713	14,279

TOLLAND COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Tolland, . .	99	21	93	78
Andover, . .	43	9	42	34
Bolton, . . .	52	20	46	32
Coventry, . .	230	37	222	193
Columbia, . .	105	11	105	94
Ellington, . .	133	27	126	106
Hebron, . .	91	5	91	86
Mansfield, . .	201	36	198	165
Somers, . .	176	25	173	151
Stafford, . .	548	130	532	418
Union, . . .	58	7	54	51
Vernon, . .	1,115	290	1,072	825
Willington, . .	102	10	100	92
Total, . .	2,953	628	2,854	2,325

NEW HAVEN COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
New Haven, . .	11,429	2,288	11,112	9,141
Ansonia, . .	1,615	382	1,557	1,233
Branford, . .	522	128	504	394
Bethany, . .	57	12	52	45
Beacon Falls, .	53	13	47	40
Cheshire, . .	235	46	221	189
Derby, . . .	878	298	794	580
East Haven, . .	72	14	72	58
Guilford, . .	337	145	316	192
Hamden, . .	435	77	424	358
Madison, . .	161	38	150	123
Meriden, . .	2,860	566	2,836	2,294
Middlebury, . .	68	11	65	57
Milford, . .	432	88	416	344
Naugatuck, . .	871	168	856	703
North Branford, .	130	27	122	103
North Haven, .	237	39	223	198
Orange, . .	530	110	529	420
Oxford, . . .	86	19	82	67
Prospect, . .	37	6	34	31
Seymour, . .	363	101	362	262
Southbury, . .	142	29	130	113
Wallingford, . .	1,106	279	1,082	827
Waterbury, . .	3,621	984	3,593	2,637
Woodbridge, . .	126	24	122	102
Wolcott, . .	56	2	56	54
Total, . .	26,459	5,894	25,757	20,565

MIDDLESEX COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Middletown, . .	1,446	441	1,415	1,005
Chatham, . .	233	31	233	202
Chester, . .	140	18	138	122
Clinton, . .	209	80	189	129
Cromwell, . .	269	49	264	220
Durham, . .	124	40	119	84
East Haddam, .	354	58	347	296
Essex, . . .	394	102	377	292
Haddam, . .	245	29	242	216
Killingworth, .	82	19	78	63
Middlefield, . .	146	32	146	114
Old Saybrook, .	158	41	148	117
Portland, . .	255	61	253	194
Saybrook, . .	185	38	178	147
Westbrook, . .	97	19	90	78
Total, . .	4,337	1,058	4,217	3,279

NEW LONDON COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
New London, .	2,450	1,282	2,033	1,168
Bozrah, . .	103	19	97	84
Colchester, . .	390	99	378	291
East Lyme, . .	153	29	137	124
Franklin, . .	76	26	67	50
Griswold, . .	362	94	326	268
Groton, . .	748	299	607	449
Lebanon, . .	208	33	192	175
Ledyard, . .	189	32	181	157
Lisbon, . . .	55	13	52	42
Lyme, . . .	111	18	108	93
Montville, .	362	11	359	351
Norwich, . .	2,540	845	2,476	1,695
North Stonington, .	214	61	179	153
Old Lyme, . .	123	18	123	105
Preston, . .	406	103	397	303
Salem, . . .	73	13	68	60
Stonington, . .	1,098	393	1,091	705
Sprague, . .	128	42	124	86
Voluntown, . .	121	34	111	87
Waterford, . .	325	61	323	264
Total, . .	10,235	3,525	9,429	6,710

WINDHAM COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Windham, . .	1,033	375	996	658
Ashford, . .	115	29	110	86
Brooklyn, . .	211	43	201	168
Canterbury, . .	124	11	122	113
Chaplin, . .	76	24	67	52
Eastford, . .	59	9	53	50
Hampton, . .	92	11	90	81
Killingly, . .	759	239	727	520
Plainfield, . .	388	23	380	365
Pomfret, . .	166	49	159	117
Putnam, . .	607	199	598	408
Sterling, . .	148	17	145	131
Scotland, . .	59	13	55	46
Thompson, . .	394	75	384	319
Woodstock, . .	226	50	210	176
Total, . .	4,457	1,167	4,297	3,290

FAIRFIELD COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Fairfield, . .	375	83	347	292
Bethel, . . .	553	224	530	329
Bridgeport, . .	7,608	1,366	7,490	6,242
Brookfield, . .	97	4	96	93
Danbury, . .	2,418	1,032	2,377	1,386
Darien, . . .	228	40	216	188
Easton, . . .	129	15	125	114
Greenwich, . .	1,101	248	1,067	853
Huntington, . .	505	135	493	370
Monroe, . .	122	34	112	88
New Canaan, .	347	107	317	240
Newtown, . .	326	71	310	255
New Fairfield, .	65	11	63	54
Norwalk, . .	2,744	1,270	2,655	1,474
Redding, . .	143	26	138	117
Ridgefield, . .	256	23	249	233
Stamford, . .	2,004	703	1,944	1,301
Stratford, . .	284	135	283	149
Sherman, . .	84	9	84	75
Trumbull, . .	136	19	135	117
Weston, . .	88	15	81	73
Westport, . .	496	211	471	285
Wilton, . . .	177	41	163	136
Total, . .	20,286	5,822	19,746	14,464

LITCHFIELD COUNTY.

TOWNS.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Litchfield,	470	129	460	341
Barkhamsted,	115	31	102	84
Bethlehem,	58	10	52	48
Bridgewater,	80	22	74	58
Canaan,	124	12	124	112
Colebrook,	124	13	122	111
Cornwall,	156	33	141	123
Goshen,	143	33	138	110
Harwinton,	117	29	109	88
Kent,	127	9	127	118
Morris,	77	13	74	64
New Hartford,	304	49	299	255
New Milford,	555	150	505	405
Norfolk,	174	17	174	157
North Canaan,	175	24	175	151
Plymouth,	343	45	334	298
Roxbury,	131	22	119	109
Salisbury,	379	125	351	254
Sharon,	284	94	260	190
Torrington,	934	227	913	707
Thomaston,	443	132	440	311
Washington,	228	30	214	198
Warren,	78	15	72	63
Watertown,	316	53	305	263
Winchester,	881	370	854	511
Woodbury,	245	63	215	182
Total,	7,061	1,750	6,753	5,311

RECAPITULATION BY COUNTIES.

COUNTIES.	Total Number Enrolled.	Minors, Members of Active Militia, and other Exempts.	Liable to Military Duty in case of War or Invasion.	Number Liable to Commutation Tax.
Hartford, . .	19,281	5,002	18,713	14,279
Tolland, . .	2,953	628	2,854	2,325
New Haven, . .	26,459	5,894	25,757	20,565
Middlesex, . .	4,337	1,058	4,217	3,279
New London, .	10,235	3,525	9,429	6,710
Windham, . .	4,457	1,167	4,297	3,290
Fairfield, . .	20,286	5,822	19,746	14,464
Litchfield, . .	7,061	1,750	6,753	5,311
Total, . .	95,069	24,846	91,766	70,223

[3.]

REPORT OF THE SURGEON-GENERAL AND THE BRIGADE MEDICAL DIRECTOR, C. N. G.

Report of Surgeon-General.

STAMFORD, NOV. 30, 1891.

Brigadier-General ANDREW H. EMBLER,
Adjutant-General State of Connecticut.

GENERAL:

The very complete and satisfactory report of the Medical Director, Lieutenant-Colonel George L. Porter, is herewith transmitted, and the record therein contained is one of which the Medical Corps of the Connecticut National Guard may well be proud. The efficiency of the Medical Department, as at present organized, leaves little or nothing to be desired, and for this fact much credit is due the Medical Director. The recommendations made in his report I heartily indorse, and hope that before another encampment, the temporary kitchens of the mess-houses will have been replaced by more sightly and commodious buildings of a permanent character. This is a matter which cannot be too emphatically insisted upon, as by the present arrangement the health as well as comfort of the soldiers is likely to be seriously jeopardized.

I respectfully recommend that the "Manual of Drill adopted for the guidance of the Medical Officers and the instruction of the Hospital Corps of the Army of the United States," be followed hereafter by the Medical and Hospital Corps of the Connecticut National Guard. In making this recommendation, I desire to extend my thanks to Major Leonard B. Almy, surgeon of the Third Regiment, C. N. G., for his untiring and successful efforts in raising the Hospital Corps to its present standard of efficiency in drill, as well as for the Manual of Drill compiled by him, which is at present in use by the Connecticut Hospital Corps.

The United States Manual does not seem in any respect superior to Major Almy's, but uniformity in drill seems so great a desideratum that I feel constrained to advise the change.

I have the honor to be,
Very respectfully,
HENRY HUNGERFORD,
Surgeon-General.

Report of Brigade Medical Director, C. N. G.

BRIDGEPORT, CONN., NOV. 16, 1891.

Brigadier-General HENRY HUNGERFORD,
Surgeon-General State of Connecticut.

GENERAL:

I have the honor to present the following report of the Medical Department of the Connecticut National Guard, during the encampment at Camp Watson, State Military Rendezvous, Niantic, Conn.

The tour of service extended from the morning of Saturday, August 15th, when the several military organizations reported to the General commanding, until they were relieved upon the morning of August 22, 1891, thereby embracing two full days of military instruction more than had been enjoyed by previous encampments.

As soon as the regiments were dismissed to quarters, the medical officers reported personally to the Medical Director, and were notified of their respective details, and informed regarding their general and special duties. The entire Medical Staff was present except Major T. F. Rockwell, Surgeon of the First Regiment.

In addition to their regular medical services with their respective regiments, special details assigned to the medical officers duties with the Battery and Separate Companies, and at the Brigade Hospital. The sick of Battery A were ordered to report to the Medical Officer of the First Regiment, and the sick of the Separate Companies to report to the Medical Officers of the Fourth Regiment.

At the Brigade Hospital a surgeon from one regiment and assistant surgeon from another regiment were on duty from 7 A. M. for twenty-four and one-half hours, when relieved by a similar detail from other regiments. Owing to the absence of the Surgeon of the First Regiment during the entire encampment, and of the Assistant Surgeon of the same regiment, who was called away for one day by serious sickness in his own family, medical services required by this regiment were one day performed by Lieutenant Daggett of the Second. The medical officers of the other regiments were constantly on duty for the eight days, for in addition to their routine duties at Sick Call, ceremonial exercises, three daily inspections of mess halls and latrines, there were frequent inspections of company quarters, drill of the Hospital Corps, attendance at Brigade Hospital, and liability to sick calls at all hours by day and by night. To their faithful performance of these many duties, and their prompt attention to all cases of acute attacks of disease at their very inception is probably due the gratifying result that the number of men excused at the Surgeon's Morning Sick Report from all duty, and ordered to hospital or quarters, has never, I believe, been proportionately as small during any previous encampment of the Connecticut National Guard.

At the Hospital, barometrical and thermometrical readings and reports of the weather and prevailing winds were recorded every three hours. The highest barometric record was 30.07 at 9 A. M., August 17th ; the lowest, 29.82 at 9 A. M., August 21st. The highest record of the thermometer was 89° at 12 M., August 17th ; the lowest, 58° at 3 A. M., August 20th. The average temperature for the entire eight days was 69.75°. With the exception of the morning of Saturday, August 15th, and the evening of Friday, August 21st, when there were heavy showers, the weather was extremely pleasant, the breeze from the Sound tempering the heat of the sun. The prevailing winds were from the southwest and southeast. The nights were moonlit.

The sanitary condition of the camp was satisfactory. The latrines, under the charge of the Quartermaster's Department, were kept clean. The large iron tubs, furnished to the caterers for the reception of garbage, were frequently emptied, and the ground about them was constantly policed. There were three daily inspections of the latrines, mess-halls, and kitchens of each military organization by their respective medical officers, and one or two daily inspections by the Medical Director.

The kitchen arrangements are now more properly the subject of criticism than anything else at the State Military Rendezvous. There is no place for the storage of cooked and uncooked provisions save the boxes of the several caterers. In these receptacles there is no separation of the ice and ice-water which is in more or less contact with meat and vegetables, and the unwholesome and spoiled food contaminates the good. In a number of instances, the regimental medical officers condemned the unhealthy meat and fish, and ordered them thrown away, together with some of the food stored with them, thus entailing loss to the caterers and creating dissatisfaction. The conveniences for cooking are crude and unsuitable. With any system of feeding the men, the present arrangements would be unsatisfactory, but a radical change is desirable, not only for the encampment at Niantic, but also in view of the liability to any more active service when the present method could not be maintained.

The Brigade Hospital has again manifested its advantages. Quite a number of soldiers, who had been taken sick after the morning sick report, were received directly in the hospital, immediately were treated for their troubles and were returned to duty before the sick report of the next morning. The rest and quiet there furnished them were largely instrumental in their speedy recovery. The regimental commanders somewhat object to the system, as they are temporarily deprived of the services of their medical officers, and because the men in hospital are not continuously under the immediate care of their own officers, but it must be remembered that the Medical Department of the Connecticut National Guard is not confined to a regimental organization, although more so than in the regular army, and experiment shows that in a permanent camp the resulting advantages have amply proved the wisdom of the establishment of the one hospital for the entire brigade. The economy of this method is recognized. The provisions for the sick in hospital were supplied from the mess of the brigade headquarters. The requisitions for medical and hospital supplies were submitted for examination to Surgeon-General Hungerford, and promptly approved. The hospital steward from the same regiment as the surgeon, and the assistant hospital steward as the assistant surgeon were on duty for twenty-five hours — the hour from 7 A.M. until 8 was occupied by them in turning over orders regarding the sick. Nurses and orderlies were detailed from the Hospital Corps.

A marked improvement has taken place in the Hospital Corps during the last year. The men have always taken pride in the prompt and careful performance of their work, and have ever evinced a commendable desire to understand the theoretical and practical duties of "first aid to the wounded," and to perfect themselves in the drill, and the criticisms of last year and the instructions of their officers since "Camp Embler" have made them careful in respect to their dress, and anxious to present the deportment of soldiers, and to observe the customs of the service. An exhibition drill was given on the parade ground of brigade headquarters by the Hospital Corps of the Third Regiment under command of Major L. B. Almy upon Governor's Day, which created much interest in the large military and civic audience, and received unstinted praise. At the next encampment it is hoped that the Hospital Corps of the four regiments may participate in a competitive drill. The organization of this corps as a distinct command has developed a better service and relieved company commands from an unwelcomed detail. For the first few days the change of food, water, and manner of living developed a tendency to intestinal troubles, which received prompt and successful treatment. The rest of Sunday, relieving the men from drill for the first day in camp, largely contributed to the effectiveness of the whole command. No serious accident of any kind occurred. Herewith is submitted the consolidated Brigade Sick Report, giving the number of men excused from duty at the Surgeon's Morning Sick Call, for each of the eight days :

DAILY MORNING SICK REPORT BY REGIMENTS, BATTERY, AND COMPANIES (SEP.).

	First Regiment.		Second Regiment.		Third Regiment.		Fourth Regiment.		Battery and Separate Companies.		Total.	
	Hosp.	Quar.	Hosp.	Quar.	Hosp.	Quar.	Hosp.	Quar.	Hosp.	Quar.	Hosp.	Quar.
1st day, .	..	..	..	..	..	..	..	..	..	..	..	..
2d " .	1	..	..	..	1	..	4	..	..	..	6	..
3d " .	1	..	2	5	3	..	1	..	..	1	7	6
4th " .	..	1	1	..	1	..	..	1	..	2	2	4
5th " .	2	1	..	1	1	2	1	3	..	2	4	9
6th " .	2	3	..	..	..	..	2	..	..	3	4	6
7th " .	..	1	..	..	1	..	1	..	..	1	2	2
8th " .	..	..	..	..	..	..	..	..	..	..	..	..
Total, .	6	6	3	6	7	2	9	4	..	9	25	27

Total strength of Brigade, - - - - -	2,670
Brigade Staff, - - - - - -	13
First Regiment, - - - - - -	683
Second " - - - - - -	713
Third " - - - - - -	534
Fourth " - - - - - -	537
Battery and Separate Companies, - - - -	190

There was no sick report made upon the first day. Upon the second, sixth, seventh, and eighth days no sick were reported from the Second Regiment ; upon the sixth and eighth days none from the Third Regiment ; upon the second and eighth days none from the Battery and Separate Companies ; upon the morning of the eighth day no one was reported sick in the entire brigade. Two men suffering from acute rheumatism had been sent home early in the week on sick leave.

The daily average number, for the eight days, of those excused from all duty and placed on sick report, was 6.5 — a percentage of .243 +, or 2.43 + per thousand.

Taking into account the personnel of the Guard, the fact that the individual soldiers represent nearly every condition of civic life, and leaving comfortable homes and indoor pursuits are immediately subjected to unaccustomed exposures and fatigues by day and night, the small amount of sickness is most gratifying. A comparison will show that it is unusual. In the Army of the United States, whose soldiers are familiar with the work, and enured to the fatigue and exposure of camp life, the average number on sick report for a period covering five years was 43.7 per thousand of mean strength (*vide Vital Statistics of the Tenth Census*).

To the Surgeon-General, Brigadier-General Hungerford, for his endorsement of the recommendations of the Medical Director, to Brigadier-General Watson, for his cordial support of the administration of the Medical Department, and to Colonel Morgan of the Quartermaster's Department, for his courtesy in supplying many hospital appointments, I hereby desire to express my appreciation and indebtedness.

The prompt and willing performance of extra and continuous, in addition to their usual, duties by the regimental medical officers entitles them to official commendation.

When all present did so well, it might seem invidious to refer to one, but it is proper to put upon record that Major C. C. Godfrey, Surgeon of the Fourth, gave up two months of his European trip in order that he might be present with his regiment in camp. The Medical Director was absent on public business upon Wednesday, August 19th, when Major Almy, Surgeon of the Third, performed the duties of the office in a very satisfactory manner.

I have but little to recommend except immediate attention to the required change in the commissariat; the completion of the wooden cases for the medicines in the Dispensary, now in the hands of the Quartermaster, and supplying the Hospital Corps with knives for the men and straps for the litters.

I would especially urge upon every regimental medical officer the importance of so arranging their personal business that they may be present during the full terms of the encampment, not alone because they may thus acquire valuable military experience, which the proper performance of their office requires, and for which they were appointed, but also because their absence imposes upon their professional associates additional duties and responsibilities.

Since the close of the encampment, the report of First Lieutenant Wm. H. C. Bowen, Fifth United States Infantry, detailed to inspect Camp Watson, has been published. The weight of its official judgment, and the cordiality of its praise, is so highly valued that herewith is incorporated an excerpt from his report relating to this department:

"There were four ambulances, two of which were kept hitched up all the time, ready for any emergency. The drill of the Hospital Corps of the Third Regiment, under the immediate charge of Regimental Surgeon Major L. B. Almy, was something to be proud of. Major Almy has adopted a system, which, to my mind, cannot be improved upon. The different regimental surgeons, with their assistants, were detailed in rotation for hospital duty, and together with the Hospital Corps did good service. The whole corps should receive praise. . . . . . Everything pertaining to the Medical and Hospital Corps of the brigade should be marked 'perfect.'"

I have the honor to remain very respectfully,

Your obedient servant,
GEORGE L. PORTER,
Lieutenant-Colonel and Medical Director, C. N. G.

Report of Brigadier-General Thomas L. Watson, Commanding Brigade, C. N. G.

BRIGADE HEADQUARTERS, C. N. G.,
BRIDGEPORT, CONN., November 30, 1891.

Brigadier-General ANDREW H. EMBLER,
Adjutant-General State of Connecticut.

GENERAL :

I have the honor to submit the following report:

In accordance with General Orders No. 8, A. G. O., dated Hartford, April 22, 1891, the companies of Infantry, Hospital Corps, Signal Corps, Machine-Gun Platoons, and Platoons of Light Artillery held their regular parades during the month of May in their respective towns. A portion of the day was devoted to rifle practice, as ordered, and the results in this line of work were good, but it is plainly evident from the reports that recruits do not receive careful instruction in position and aiming drill. Such of the organizations as have rifle ranges in their armories could greatly advance the work of this line if more attention and time were devoted to practical and theoretical instruction during the regular drill season.

A portion of the several field days was devoted to instruction in guard duty and skirmish drill, with only fair results in the former, but an improvement was shown in the latter, and the orders by bugle were more thoroughly understood. Reports of these parades have been duly forwarded to you. Those of the First Regiment were much delayed, not having been received at these headquarters until October 19th, and then irregularly sent through your office.

Commanding officers do not thoroughly appreciate the necessity of prompt forwarding of all official documents, nor do some of them seem to realize that the delay on the part of one will at times seriously inconvenience the work of the entire Brigade.

On July 2, 1891, the following was issued by the Commander-in-Chief:

STATE OF CONNECTICUT.

Adjutant-General's Office,
Hartford, July 2, 1891.

General Orders,
No. 17.

I. The Commander-in-Chief having been advised of the Senate's action in adopting a resolution disapproving General Order No. 6, A. G. O., series of 1890, and, so far as it had power, reinstating Charles P. Graham as Brigadier-General, honorably discharged by said order; and the Commander-in-Chief, disagreeing with the Senate in its construction of and its powers under the law, yet, for the purpose of this order, recognizing the fact that the Senate has taken such action, does, by virtue of the powers vested in him by the Constitution and laws of this State, hereby discharge said Charles P. Graham from the military service of the State for the benefit of the service.

II. Thomas L. Watson of Bridgeport, Conn., late Colonel commanding Fourth Regiment, Connecticut National Guard, is hereby appointed to the command of the Brigade, Connecticut National Guard, with rank from March 1, 1890. He will be obeyed and respected accordingly.

By order of the Commander-in-Chief,

ANDREW H. EMBLER,
Adjutant-General.

In obedience to, and compliance with such orders, I issued the following:

BRIGADE HEADQUARTERS, C. N. G.

Adjutant-General's Office,
Bridgeport, July 3, 1891.

General Orders,
No. 1.

By General Orders No. 17, dated Adjutant-General's Office, Hartford, July 2, 1891, I have been appointed to the command of the Brigade, Connecticut National Guard. In compliance with such orders of the Commander-in-Chief, I assume such command.

THOMAS L. WATSON,
Brigadier-General Commanding Brigade, C. N. G.

In compliance with General Orders, No. 18, A. G. O., c. s., the Brigade, Connecticut National Guard, was duly ordered to assemble at the State Camp Ground, Niantic, Conn., on Saturday, August 15, 1891, for an eight-days tour of duty and instruction under the immediate orders of the Brigade commander. General Orders No. 3 were issued from these headquarters on August 1, 1891, in which careful attention was given to the various details necessary for the conduct and government of the camp.

In conjunction with the original designation of State Military rendezvous, the Commander-in-Chief did me the honor of naming this C. N. G. encampment after the Brigade commander. This compliment was sincerely appreciated, and an earnest effort was made to make the camp a successful one.

The first of the troops to arrive was the Battery, under command of Captain Fowler. They were followed by the Third Regiment, under Col. Haven; the First Separate Company under Captain Lathrop; the Second Regiment, under command of Col. Doherty; the Fourth Regiment, commanded by Col. Skinner; the Second Separate Company, commanded by Captain Freeman; and the First Regiment, Colonel Erichson,— all in the order above named.

The additional railroad facilities which had last year been provided by the railroad company expedited the arrival and disembarking of the troops; the new military road leading from the spur tracks to the main thoroughfare of the town had been materially improved by the Quartermaster-General's Department, by widening and grading and the removal of the house owned by the State from the north to the south side of the lot. It is to be hoped that the railroad authorities will, before another year rolls around, make further permanent improvements in the form of platforms for unloading and additional spur tracks in connection with the double tracking of the Shore Line Road now in progress. In the formations of the regiments after disembarking from the cars more time was taken by some of the regimental commanders than should be used in this work. It is not for the purposes of dress parade or show, but for efficiency in unloading, forming, and moving the troops, and as a test of the capabilities of the men and their commanders in this line that promptness is here called for.

Owing to some delays on the railroad the Fourth Regiment did not arrive at the camp until nearly 3 o'clock, consequently the Guard Mount, which had been ordered for that hour, was postponed until 3.30, when full dress guard mounting by all the regiments took place. In the meantime, Col. George Haven, who, with his command, was the first to arrive on the grounds (about 1 P. M.), asked permission for a battalion drill, not down in orders, and which being promptly granted, his entire regiment, with the exception of those detailed for guard, were exercised in battalion movements for about one hour.

The men of the Brigade settled down to the performance of their duties quickly and creditably, and the experiment of a Sunday in camp proved to be a great success. Apprehensions had been previously expressed by many in and out of the National Guard as to the conduct of the men during Sunday, but the unanimous opinion of the several Chaplains and the Vicar-General, appointed to administer the Roman Catholic service, was to the effect that a more proper observance of the day would be impossible upon a camp ground where over 2,500 men were assembled. The services previously ordered were well attended, and the evening service at Brigade Headquarters, conducted by the several Chaplains and the Vicar-General, was a most successful meeting. The results of this Sunday, coupled with the great gain of the guard of the two additional days, should be sufficient recommendation to our legislators to provide the means in future for eight days encampments.

The Sea Coast Battery drill was under the immediate instruction of Sergeant John R. Cashman of the Second Artillery, United States Army, stationed at Fort Adams. Upon request, he was again detailed, having performed his duties creditably last year, and he gave close attention to the work assigned him. Following the experiences of Camp Embler the details for this work were made from the four regiments, and the results accomplished were satisfactory.

The situation of our State upon the seacoast calls for instruction in heavy gun and mortar practice, and while through the use of the earthworks at camp a few members of this command are gaining slight practical knowledge in this line, it is most desirable that greater progress should be made ; and in this connection I earnestly recommend the early formation of a Naval Reserve similar to the New York organization.

The light artillery is well organized and well officered, and the men are earnest in their work and manifest a desire to learn, but new guns and new equipments are needed if our State is to keep in line in this branch of the service. The machine-gun platoons of the different regiments were again organized as a battery, and drilled as such with most favorable results ; at brigade dress parade, by my orders, they were formed and paraded as a battery, for the first time, upon the left of the infantry organizations. It was a new departure, but the results were most satisfactory. The work done by these organizations during this encampment was very creditable, and both officers and men evidenced their interest by the promptness and willingness manifested in their work. Lieutenant Avery of the First Machine-Gun Platoon being the senior officer, was in command of this battery, and is an earnest and hard-working officer.

The Signal Corps service, under the efficient instruction of Major Charles L. Burdett, Engineer and Signal Officer of the Brigade Staff, made this year some rapid strides in a special bicycle service. I cheerfully concurred in his original proposition to request the different Signal Corps organizations to, as far as possible, equip their men for the bicycle work. The First Regiment Corps, under Lieutenant Giddings, came to camp thoroughly prepared with new light-running "Hartford" bicycles and Colt's revolvers and repeating carbines. The practical working of these wheels was demonstrated in connection with the outpost duty, and messages were sent to and from the camp with a surprising speed; in several instances the messages were more promptly delivered than through the system of signals by flag. It might be a consideration in future enlistments in this corps that men should be able to ride the bicycle, and that drills in this line should be undertaken and maintained throughout the drill season, so that when the different organizations came together in camp the entire Signal Corps of the Brigade would be competent to undertake the bicycle service, and the several organizations could be there consolidated after the manner of the Machine-Gun Platoons, under the charge of the Brigade Signal Officer and senior Lieutenant. There are great possibilities in this line of work, and it is one which will greatly interest both officers and men in all its practical workings. I would recommend that the State furnish the several Signal Corps with Colt's repeating carbine and with revolver. There should be sufficient interest in this work for the men to provide their own cycles until the State should require fighting service.

The review of Friday, the 22d, in honor of the Commander-in-Chief, was most creditable. The attention of the men while the Governor was passing down the line, the steadiness with which each command passed the reviewing officer, with the well-preserved alignments and intervals, were something to be commended. The chief criticism of this work is the tendency on the part of the men to crowd the guides before and while passing the reviewing officer. The different infantry organizations were allotted their usual time for battalion work, and they, with the Consolidated Battery of Machine-Gun Platoons and the Battery of Light Artillery gave very reditable exhibition of drills in their different branches. The exhibition bicycle drill was a new departure, and was greatly appreciated by the very large number of people in attendance.

The special guard at Brigade Headquarters this year was an improvement, and their daily salute to the color at dress parade was a new departure, and a ceremony impressive and important.

His Excellency the Governor and Commander-in-Chief arrived at Niantic on Monday, August 17, at 3 P. M., and was met at the depot by the Adjutant-General and the members of the Governor's Staff, the Brigade Commander and his staff, and the staff officers of the several organizations in camp. With this mounted escort he rode to the camp ground, where the usual salute was fired in his honor. He remained throughout the week, and was active in manifesting his interest in the entire work of the Brigade, as did our most efficient Adjutant-General. This interest was fully appreciated by the men, and much satisfaction was felt and expressed for the active interest and attention thus manifested by Governor Bulkeley and General Embler.

We were favored this year by visits from a number of prominent people, many of our State Senators and Representatives being for the first time upon the camp ground, and it is exceedingly gratifying to know that, both during their visit and later on, they have universally expressed their appreciation of the work done by the Connecticut National Guard, and of the service rendered the State.

Owing to serious illness Lieut.-Colonel Louis N. Van Keuren, Assistant Adjutant-General of the Brigade, was, much to my regret, unavoidably and unexpectedly absent. Orders were issued from these Headquarters instructing Major P. H. Ingalls, the Brigade Inspector, to assume, in addition to his other duties, the position of Acting Assistant Adjutant-General, which duties he performed throughout the encampment with credit to himself and the Brigade. Taking up this additional work without previous preparation he devoted himself carefully and conscientiously to it, and is deserving of commendation.

I duly forwarded to Surgeon-General Hungerford the very complete and able report of Lieut.-Colonel George L. Porter, Medical Director of the Brigade. As will be seen by reference to this report, the health of the command during the entire eight-day encampment was all that could be desired, and by comparison with previous encampments, as well as the experiences in the Army of the United States, the showing was remarkable. The daily average number for the eight days shows a percentage of 2.43 per thousand excused from duty and placed on sick report.

The very interesting report of Lieutenant Bowen to the Adjutant-General U. S. A. states that everything pertaining to the Medical and Hospital Corps of the Brigade C. N. G. should be marked perfect.

Details for the inspection of quarters were again made from the officers of the Brigade Staff, and the system of marking was slightly changed from that of last year. Careful attention was given to this duty by both officers and men, and the condition of the company streets at 8 A. M. each morning when the inspection was made was something to deserve the very highest commendation. The tents were all neatly dressed in careful conformity to the rules furnished, and the company streets were wonderfully clean. Officers and men were all anxious to obtain the highest percentage mark at these inspections, and in many instances 100 per cent. was continuously gained.

In the matter of outpost duty Major Burdett, Engineer and Signal Officer, had carefully prepared a topographical map of the camp and its surroundings. With the aid of this map he outlined to the several commanding officers the lines of resistance, and left to their judgment all the deployments. The attacking force was usually one of the Separate Companies, and the work by these companies of colored troops was most creditably performed. Captain Lathrop, who commanded the Provisional Battalion, is a hard-working and capable officer, as well a good disciplinarian. Grand Guard work and outpost duty needs to be carefully studied by officers of the C. N. G. This work is of great value, as it furnishes much of a practical knowledge to officers and men in the field, accustoms them to choose advantageous positions, familiarizes the men with the use of fire-arms when acting independently, and is indeed of much practical benefit when carefully and thoroughly conducted. Major Burdett is deserving of much credit for the hard and efficient work he devoted to this branch of the service.

The Brigade Tournament was ordered in General Orders No. 9, Brigade Headquarters c. s., but subsequently postponed on account of threatening weather by General Orders, No. 10, Brigade Headquarters c. s., and was held at the First Regiment Rifle Range in Hartford, Conn., on Wednesday, October 21st. The weather proved propitious, and much interest was manifested in the result of the competition. There were four teams present representing the respective regiments of the Brigade, and the competition resulted in the Third Regiment carrying off the first prize, with a total score of 613 at the two ranges — 200 and 500 yards. The First Regiment team made the next highest score of 607, while the Second Regiment recorded 584 at both ranges, and the Fourth Regiment team made a total score of 482. The report of Major Edward I. Williams, Brigade Inspector of Rifle Practice, C. N. G., dated October 26, 1891, on file at your office, will give the details of this tournament.

The Hartford Range is in many respects well adapted for the State competitions, but I would recommend that better butts be provided, and that they be thoroughly protected, and that better facilities be provided for the markers, as the reports of the Inspectors of Rifle Practice indicate that they are not now arranged so as to provide the necessary room from which to quickly and carefully observe the targets. The question of marking is one that calls up more criticism and dispute than any other in competitive shooting, and it should therefore receive the greatest care. Skirmish firing at targets should be a part of the field work.

In the inspection and muster of the Brigade, held during this month, I found the general condition of the troops to be good. New clothing and new rifles are both needed, particularly the latter, and it no doubt will be the aim of the Adjutant-General's Department to supply the Brigade with a new rifle at the earliest possible day. The record books of the Brigade are only fairly well kept, and the attention of commandants has in many instances been called to the slighting manner in which the clerical work of some companies and headquarters is performed.

During the year ending December 1, 1891, your office has officially recognized the loss by death of Major John C. Kinney of the First Company of Governor's Foot Guard, and Brigadier-General Frederick E. Camp, formerly Paymaster-General on the staff of Governor Bigelow, and Adjutant-General on the staff of Governor Lounsbury. Both of these officers were friends and supporters of the National Guard, and their death is a matter of sincere regret and a loss to the National Guard of this State.

My observations during this year of service lead me to make the following *suggestions:* Broad-soled shoes of a uniform pattern, and white collars of a uniform height should be worn. Webb cartridge belts should be supplied, and sabres worn by all mounted officers.

The State should provide bathing facilities at the camp ground at Niantic, and this could be readily done in the cove to the north of the Quartermaster-General's Department, where, at a comparatively slight cost, a space could be dredged or dug out providing a hard bottom and increased depth of water, with a float and such other appointments as might be desirable, and a retired location thereby secured. A fence should be built on the north side of the State ground. A small sewer might be built the length of the State property through the usual line of Company officers street, and catch-basins could be readily connected with each pump with earthenware pipes, which would carry off all the surplus water which at times accumulates around the pumps, as well as assist the drainage.

Permanent kitchens should be built without delay. Rations of good quality should be furnished the men, and the matter of messing be conducted by the State through the Commissary-General's Department, improving thereby the system and avoiding many causes of complaint. I would suggest that the Governor's Horse Guard might be constituted a squadron of cavalry attached to the C. N. G. If necessary, they could keep their own name and designation.

The huckster-stands around the entrance to the camp are a source of great annoyance, and, as suggested in my last annual report, the legislature should confer upon the Brigade commander power to suppress and control nuisances within a mile of the camp ground during the encampment, which authority is now practically confined to the sale of liquor within that distance.

In conclusion, I again refer to the very able and complimentary report of Lieutenant Wm. H. C. Bowen, Fifth U. S. Infantry, covering his inspection of the C. N. G. at Camp Watson. His complimentary allusions are appreciated by the members of the Guard, and these Headquarters. His criticism and suggestions should be carefully heeded by all, and be made the subject of study for future improvement.

I desire to express my obligations to the Adjutant-General's and Quartermaster-General's Departments for the uniform courtesy I have received at their hands.

Very respectfully,
THOMAS L. WATSON,
Brigadier-General.

REPORT OF INSPECTION OF THE NATIONAL GUARD OF CONNECTICUT.

Report of First Lieutenant Wm. H. C. Bowen, Fifth Infantry, U. S. A.

NEW HAVEN, CONN., August 29, 1891.

THE INSPECTOR-GENERAL U. S. ARMY,
Washington, D. C.

SIR :

I have the honor to report that in compliance with letter of instruction from the Adjutant-General's office, dated June 8, 1891, supplemented by instructions from your office of June 15, 1891, I visited the encampment of the Connecticut National Guard at Niantic, Conn., August 15–22, 1891 (both dates inclusive).

I arrived at Niantic in company with the Adjutant-General of the State, Brigadier-General A. H. Embler, at 11.02 on the morning of the 15th. We were met by Colonel Morgan, Assistant Quartermaster-General, who drove us to camp, distant from the station about three-quarters of a mile.

The camp, called Camp Watson in honor of the brigade commander, is situated on a plain by the Niantic River, swept by the cool breezes from Long Island Sound, and admirably adapted to the purposes for which it is used.

The tents were already pitched, each with a good floor, and with three mattresses for each tent to be occupied by the men ; the three mattresses completely covered the floor and made a good resting-place for four men. The length of the color line was fully one-third of a mile.

Together with General Embler I paid my respects to the commanding officer, Brigadier-General Thomas L. Watson, and reported my arrival. A wall tent, furnished throughout, had been provided for me with the governor's staff, with whom I was invited to mess. From His Excellency Governor Morgan G. Bulkeley down to the private soldier I received a most cordial welcome, and I herewith extend to them all my most hearty thanks. Better men for their positions than General Embler as adjutant-general, and General Watson, brigade commander, could not be picked out. When I say that both of them are *soldiers*, I pay them the highest praise.

Battery A had already arrived in camp when I reported, but I was in time to see the different regiments come in.

The Third Regiment, Colonel George Haven, was the first to arrive, marching into camp at 12.55.

The First Separate Company (colored), Captain Lathrop, followed at 1.20.

Next came the Second Regiment, Col. John B. Doherty, with 691 men out of a total of 722, a remarkable showing. They came at 1.30, followed by the Fourth, Col. Henry Skinner, at 2.53.

The Second Separate Company (colored), Captain Freeman, marched in at 3.15, followed by the First Regiment, Col. Charles B. Erichson, at 3.20. Total per cent. of whole brigade present, 93.96.

The Third Regiment wore overcoats coming into camp, as the weather was threatening, otherwise in full marching order with leggings. The other troops all in full marching order, overcoats strapped to knapsacks, and all wearing leggings.

I wish to call especial attention to the following: The Third Regiment, Colonel Haven, arrived at 12.55; at 2.30 the whole regiment, with the exception of those for guard, were out at battalion drill.

Full-dress guard mounting took place at 3.30, each regiment mounting its own guard.

ORGANIZATION.

The governor is the commander-in-chief, with a staff as follows:

With rank of brigadier-general: Adjutant-general, quartermaster-general, surgeon-general, commissary-general, and paymaster-general.

With rank of colonel: Assistant adjutant-general, and assistant quartermaster-general, who are salaried officers; and four aids-de-camp.

The Connecticut National Guard consists of thirty-eight companies of infantry, four machine-gun platoons, and one battery of artillery. The companies of infantry are organized into four regiments, the First and Second of ten companies each, and the Third and Fourth of eight companies each. Besides the regiments there are two separate companies of colored troops, officered by colored men. There is no cavalry. To each regiment are attached a machine-gun platoon (Gatling), averaging 1 officer and 7 men each; a hospital corps of 2 officers and 5 men ; a band of 20 men ; and a signal corps of 1 officer and 9 men.

The troops are organized into a brigade commanded by a brigadier-general, having a staff consisting of an assistant adjutant-general with rank of lieutenant-colonel, a brigade inspector, quartermaster, commissary, inspector of rifle practice, and engineer and signal officer, all with the rank of major : a medical director with rank of lieutenant-colonel, and two aids-de-camp with rank of captain. The medical director must be a graduate of a lawfully established medical college, and must have been in practice at least five years. The engineer and signal officer must be a civil engineer of at least three years' standing.

The brigade non-commissioned staff is composed of one chief trumpeter and two brigade orderlies. All rank as sergeants and all mounted, one carrying brigade color.

Each regiment is officered as follows : A colonel, lieutenant-colonel, and major, and adjutant with rank of captain, a quartermaster and paymaster, each with rank of first lieutenant, a surgeon with rank of major, and an assistant surgeon with rank of first lieutenant, an inspector of rifle practice with rank of captain, a signal officer with rank of first lieutenant, and a chaplain without rank, but entitled to pay of adjutant.

The non-commissioned staff consists of a sergeant-major, a quartermaster-sergeant, a commissary-sergeant, a hopital steward, a chief trumpeter, and a drum major, all appointed and warranted by the colonel.

All surgeons and assistant surgeons must be graduates of a lawfully established medical college, and all hospital stewards must be licensed by the State commissioners of pharmacy.

Each company is composed of a captain, a first and second lieutenant, a first sergeant, a quartermaster-sergeant, 4 sergeants, 8 corporals, 1 trumpeter, and 2 musicians, and not more than 64 nor less than 32 privates. (Each company averages a total of 64 officers and men.)

Each machine-gun platoon consists of 1 second lieutenant mounted and such number of non-commissioned officers and privates as may from time to time be designated by the commander-in-chief, averaging at the encampment 1 officer and 7 men.

The battery of artillery consists of a captain, 2 first and 2 second lieutenants, 1 first sergeant, 1 quartermaster-sergeant, 1 veterinary sergeant, 4 sergeants, 8 corporals, 2 trumpeters, 1 guidon, and not more than 64 nor less than 32 privates. The battery is divided into two platoons, each commanded by a first lieutenant. (Total number of officers and men at camp, 74.)

PAY AND ALLOWANCES.

For each day's service in complete uniform at parades and encampments authorized, shall be paid to each officer, musician, and private, $2 per day: to the drum and fife major and members of the band, $2.75 per day. Each mounted officer in addition is paid $5 per day for use of horse; for each artillery horse, $2 per day.

Rations and forage, or commutation thereof, as prescribed by the U. S. Army Regulations.

In addition to above each commander, company commander, and commander of each platoon of artillery, $50 per year, and the commander of each machine-gun platoon, $25 per year.

All officers ordered to special duty by the commander-in-chief receive such pay as may be designated by him.

Each officer or soldier wounded or disabled, and the widow and children of each officer or soldier killed while in the service of the State shall be suitably provided for by the General Assembly.

CLOTHING.

Suitable clothing after the pattern of the U. S. Army is furnished to each enlisted man by the State. Each officer furnishes his own, and is allowed $10 per year for care of same. The clothing of the men is old and worn and needs to be replaced.

EQUIPMENTS.

One regiment of infantry is armed with the Springfield rifle, caliber .45; the rest of the infantry with the Peabody, same caliber. As the company which manufactured the latter has gone out of business, small parts cannot be secured, therefore if any part breaks it cannot be replaced, consequently the arm is not a desirable one. The State intends, so I am informed, to re-arm the brigade with the arm to be adopted by the War Department. This applies as well to the artillery (which now has a battery of 3-inch Rodman guns) as to the infantry.

Haversacks, canteens, and knapsacks are furnished by the State. Each organization furnishes its own leggings. The old pattern McKeever cartridge-box is used. The State has no web belts for field service.

EQUIPAGE.

The State owns sufficient serviceable equipage to fully equip the brigade. It consists of hospital tents and flies for field hospital, and officers' wall tents and flies for officers, and walled common tents for enlisted men, four men to each tent.

MESSING.

The messing is done by caterers, each caterer having one or more companies. The ration to the men is commuted at thirty cents each, and each organization makes its own contract with the caterer. The system is bad, and there is much complaint. I would suggest that the messing be placed in the charge of the commissary department.

The State has built good mess-houses for each regiment and for brigade headquarters and for the governor and staff. The kitchens at the different mess-houses are simply sheds. Something should be done to remedy this defect. (Action since camp is being taken.)

POLICE IN CAMP.

The policing of camp was first-class in every particular. Tents, company streets, kitchens, sinks, etc., were inspected each day by some one of the brigade officers in addition to the inspection of regimental and company officers. Sinks were kept sweet and clean, all slops were removed twice a day, and police parties were about from time to time during each day and evening to remove any rubbish which might have been carelessly thrown on the parade or about the different headquarters.

HOSPITALS.

The hospital was situated in rear of brigade headquarters, distant about 100 yards, and in charge of Lieut.-Col. George L. Porter, who, some twenty years ago, resigned from the regular service.

There were four ambulances, two of which were kept hitched up all the time, ready for any emergency. The drill of the hospital corps of the Third Regiment, under the immediate charge of Regmental Surgeon Major Leonard B. Almy, was something to be proud of. Major Almy has adopted a system which, to my mind, cannot be improved upon. The different regimental surgeons, with their assistants, were detailed in rotation for hospital duty, and together with the hospital corps did good service. The whole corps should receive praise.

There was little sickness in camp, the average number per day being but five.

Everything pertaining to the medical and hospital corps of the brigade should be marked " perfect "

MACHINE-GUN PLATOONS.

The four machine-guns were formed into a battery, and drilled as such. Too much praise cannot be accorded this corps for the efficient manner in which its duty was performed. For two days I was with the troops performing outpost duty ; on each day a different gun went out with the attacking force, and to see the way in which advantage was taken of every shelter, the manner in which the gun was taken by hand over ground impossible for horses, and the manner in which the whole work was performed would have led a stranger to believe that disciplined " veterans " were doing the work.

SIGNAL CORPS.

Each regiment has a signal corps attached to it of one officer and nine men.

The flag and torch service was well performed, but the First Regiment deserves honorable mention on account of its special bicycle service. Under its commanding officer, First Lieut. Howard A. Giddings, this corps of wheelmen has reached a high degree of proficiency. Maj. Charles L. Burdett, brigade engineer and signal officer, was the originator of this plan, and to his energy and perseverance the corps is indebted for its excellence. The men were armed with the Colt's repeating carbine and with the revolver. A man mounted on a bicycle can go many places where it would be impossible to take a horse, and it can beat the "flag" in sending messages in nearly every case. As a fighting force it may not be favored, but as messengers, patrols, and advance guard, in my opinion, it would be invaluable. I would recommend to the serious consideration of the War Department the advisability of experimenting with the bicycle.

Speaking of the utility of the wheel in actual warfare, General Wolseley is reported to have said : "There are few countries in the world where you cannot use 'cycles. . . . I do not remember one day's march or any one fight in which we took part where 'cyclists could not have been used with the greatest possible advantage."

The principal duties of the military 'cyclist are those of carrying dispatches, skirmishing, and reconnoitering. As applied to the Signal Service, the wheels, in my opinion, would almost double its usefulness.

The signal corps, under direct charge of Lieutenant Giddings, put up a complete telephone system in camp, which was most convenient, each regiment being connected with headquarters, the hospital, the quartermaster's department, and the stables.

One of the companies of the Second Regiment from Waterbury, G, took into camp a cage of carrier pigeons. Several were liberated each day, and with messages attached to their legs made the trip of about sixty-three miles in a trifle over an hour.

LIGHT ARTILLERY.

There is but one battery, A, in the State, officered by a captain and four lieutenants, and having sixty-nine enlisted men. The guns are four 3-inch Rodmans. Equipments are poor, but notwithstanding the fact that the horses are taken from the farm and are hitched up but seven days in the year for this kind of work, the degree of proficiency obtained is remarkable. Captain Fowler and his battery deserve great credit for the excellent drill and discipline attained.

HEAVY ARTILLERY.

The earthworks at camp are armed with two 10-inch Rodmans and four 10-inch mortars. Sergeant Cashman, Second Artillery, stationed at Fort Adams, was detailed as instructor in heavy-gun and mortar practice, and performed his duties well. Plaster shells were used with small charges of powder, and the drill and instruction were most satisfactory.

MILITARY DUTY.

Military duty was well done. At roll-calls the command "Fall in" by first sergeants was, as a rule, a little slow, but that was the fault of the individual; few enlisted men were absent from calls. The calls were sounded promptly by the chief trumpeter at brigade headquarters, and promptly repeated by the regimental and company musicians. Formations for drills were fairly prompt, and for parades could not be improved upon. When I say that at one parade the different regiments were formed and presented to their colonels within seventy-eight seconds from the first note of the band, the degree of promptness attained may be realized. Guard mounts and parades throughout the week were prompt and went smoothly, showing that much attention had been paid to these ceremonies during the drill season. Guard duty was fairly well done; men generally were fairly well posted and knew their duties.

The whole of each day except Sunday was devoted to military duties, and there was no shirking. Each man, except the sick, the guard, and some few specially excused, was required to attend all roll-calls and all drills. Reveille sounded at 6 A. M., and from that time till the dismissal of brigade dress parade, at about 6.10 P. M., every officer and man in camp was at work.

DRILLS.

The infantry were drilled each day in company and battalion skirmish drill, and in the school of the battalion; also in outpost duty. The country about Niantic is well adapted for this latter duty, and officers and men took much interest in it. The colored troops particularly should be mentioned, as they make such splendid skirmishers and scouts.

Outpost duty may be said to be a fad with Major Burdett, engineer and signal officer, and he gives much time and study to this branch of military duty.

TARGET PRACTICE.

There was no target practice during camp week. All target firing is done by the different organizations during the spring and summer months. In this State there is no skirmish target practice, which I think is to be regretted.

INSPECTIONS.

Each organization was inspected every morning at 8, also the mess-houses, sinks, company streets, etc. This inspection of the company tents, streets, etc., was a revelation. Mattresses and blankets were nicely piled and folded, with clothing, helmets, etc., neatly laid on top; arms in racks; shoes, etc., polished and placed at back of tent, toes to front. Too much credit cannot be given to the companies for the neatness and the dressing of the tents, and the cleanliness of the company streets. Within four hours of breaking camp one of the regiments had a mark of 100 per cent. at this inspection, which mark was nothing unusual during the week throughout the brigade, but deserves special mention, reference being had to the time. The companies under arms were not inspected man by man and piece by piece, which I think is to be regretted.

The Governor was in camp from Monday at 5 P. M., till Saturday at 7 A. M. He made frequent personal inspections of tents, sentinels, buildings, etc., and took great interest in the encampment. He also took frequent rides about the country, accompanied by his staff (to which I had the honor to be temporarily attached), and inspected the working of the outposts. He is a hard worker and a great believer in the Connecticut National Guard, and it is owing to his judgment and firmness that the brigade has such an excellent commander, and that it was in camp eight days instead of six, as was usual.

The review on Friday, "Governor's Day," was something to be remembered. Twenty-five hundred disciplined men in line were a magnificent sight; the "march-past" was steady, lines well dressed, and intervals fairly well preserved. When guides are a little better instructed the distances will be better taken.

QUARTERMASTER'S DEPARTMENT.

I cannot close this report without giving a few words of commendation to this most excellently-managed department. Under its chief, Brig.-Gen. William B. Rudd, ably assisted by Col. Henry C. Morgan (a retired army officer), the State of Connecticut has a department to be relied on. It is well organized, well supplied, and well manned. To go into details would take up too much space; I therefore leave it with the few remarks already made.

GENERAL REMARKS.

General Watson has acquitted himself to the satisfaction of the brigade throughout. He has deservedly won the esteem, respect, and regard of every man in the brigade, from "high private" up. The officers to a man are loyal to him, and it is no false praise to say he is in command of the finest brigade encampment the Connecticut National Guard ever held.

It would be neither fair nor just in the light of the excellence of the encampment to pass severe words of censure upon the minor details that are unquestionably open to criticism, for nothing else that I have seen can be found fault with. The brigade, as a whole, is thoroughly proficient, and the faults which are apparent are of such a nature that they cannot be criticised. from the fact that with a little more training of the men, which I believe they honestly desire, instruction will overcome the chief obstacles of objection that have arisen, and do away with all the criticism that would arise.

Too little attention is paid in the matter of salutes. There is not enough respect shown for the officers. When men don a uniform their *individuality* becomes extinct, and they should forget familiarity and honor the *offices* if they do not honor the men who occupy them. The militiamen are *ready* and *willing* to learn, and all they need is instruction in this respect. The fault lies with the officers and non-commissioned officers, who, as a rule, overlook this matter and are careless.

The non commissioned officers are not strong and forcible enough. If they would exact more respect it would be gladly given, for, I repeat, the men are anxious and willing to obey orders and to pay respect, only they do not know how and need teaching.

The guard mounts at camp have been all that could be desired. They have been executed with snap and vim. Especially noteworthy was the guard mount of Saturday morning, when it was performed as faithfully as at any time during the week, and that on the eve of breaking camp. I have no hesitancy in saying that there is material enough in the National Guard of the State to make veterans in thirty days if put to the test.

The brigade staff is composed of hard and intelligent workers, while the same is true of the leaders of the governor's staff. The colored troops are simply perfect, and in getting through the brush as demonstrated on grand guard, they exhibit the traits of Indians, and in scouting exhibit an acuteness that is absolutely marvelous. The camp was simply perfect, and I have no hesitancy in saying that if the exigency arose to-morrow the Connecticut National Guard could turn out at a moment's notice enough men equipped and with military knowledge to act as line officers for a whole brigade. The camp has been a great success, and I say, unhesitatingly, that it is one of the finest brigades in the United States.

One innovation deserves mention, and that is the presence in camp of representatives of the Young Men's Christian Association. They provided a large round tent, well equipped with free tables, chairs, benches, lights, newspapers, shoe-brushes and blacking, pens, ink, paper, etc. The tent was well patronized during the week and served its purpose well.

On the only Sunday in camp there were present each regimental chaplain, and also, for those of the faith, a Roman Catholic priest.

Services were ordered to be held, and were held, at 8 and 10 A. M., and at 8 P. M., and all were well attended. In addition there were two services in the afternoon not ordered. A prominent clergyman, who was present in camp, said that he wished every one in the State could know of the details of the Sunday observance. He said that he was surprised and delighted at the conduct of the men, not only on Sunday, but during the week. When the order for the eight days' encampment was first issued, he had fears that Sunday would be a day of idleness and drunkenness, but instead, the good order, the well-attended meetings, the quiet and reverence shown, were something he wanted to remember, and something he wished to thank the men for, and which he wished to tell the people of, that in future no objection would be made by religious people to an eight days' encampment.

I beg leave in closing to again express my appreciation of the many acts of courtesy received at the hands of the Governor and his staff, the Brigadier-General and his staff, and from the different regimental and company commanders.

WM. H. C. BOWEN,
First Lieutenant, Fifth Infantry.

REPORTS OF STAFF OFFICERS, BRIGADE, C. N. G., REGARDING ANNUAL ENCAMPMENT.

Report of Major Phineas H. Ingalls, Brigade Inspector, C. N. G.

HARTFORD, CONN., NOV. 21, 1891.

Brigadier-General THOMAS L. WATSON,

Commanding Brigade C. N. G., Bridgeport, Conn.

SIR:

I have the honor to submit the following report of duties performed by me during the encampment of the Connecticut National Guard at Camp Watson, August 15–22, 1891.

In orders issued at the opening of the camp, I was detailed as Acting Assistant Adjutant-General, owing to the sudden illness of Lieut.-Col. Louis N. Van Keuren, Assistant Adjutant-General. It is a matter of sincere regret that your headquarters were deprived of the valuable services of Col. Van Keuren at so important and critical a time. Being called upon suddenly, with no time for preparation, and being perfectly new to the position, I wish to acknowledge to you my appreciation of your uniformly kind and courteous treatment of me, and your forbearance with my lack of knowledge of the many petty details connected with that department; and to the officers of the Brigade, with one exception, I wish to extend my thanks for their uniform kindness and courtesy towards me in my administration of the affairs of that department.

ARRIVAL OF THE TROOPS.

To Major Isaac Bromley, Jr., was assigned the duty of noting the arrival of the various organizations, and from his report made to me, I submit the following tabular statement:

	Train due.	Train arrived.	Formation.	Started for camp.	Time.
Battery A,	9.30	9 57	10.10	10.17	20 m.
First Regiment,	2.40	2.55	3.03	3.08	13 m.
Second Regiment,	12.00	1 03	1 10	1.14	11 m.
Third Regiment,	12 00	12.30	....	12.37	7 m.
Fourth Regiment,	2.25	2.30	2.37	2.42	12 m.
First Separate Company,	12.00	1.03	....	1.07	4 m.
Second Separate Company,	2.40	2 55	....	3.00	5 m.

INSPECTION.

So much of my time was consumed in the duties of Assistant Adjutant-General that I did not have an opportunity to make a thorough inspection of the books and records throughout the Brigade, as I had intended; but since camp, I have had occasion to examine the books in over twenty different organizations in the Brigade, and find as a whole that they are only fairly well kept. I can only recommend that more attention be paid to this matter by the company commanders themselves, and not leave so much of the responsibility on the company clerk.

In the inspection of quarters and policing the same plan was adopted as last year. Before the encampment I carefully prepared a bill of dress and had a copy issued to each tent. By your direction, I assigned the following officers as Inspectors: First Regiment, Major Williams; Second Regiment, Major Hubbell; Third Regiment, Major Burdett; Fourth Regiment, Capt. Bishop; Separate Companies and Battery, Capt. Kellogg.

The system of rating followed was the same as that of last year, which is detailed at length in my report published in the Annual Report of the Adjutant-General for 1890. As the tables appended will show, I have great satisfaction in reporting a most marked improvement in the carrying out of this order.

FIRST REGIMENT.

	INSPECTION OF QUARTERS.						POLICING.					
	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Band,	88	64	52	76	94	100	100	....	....	75	75	100
Company A,	94	100	94	76	58	94	100	50	75	100	75	100
Company B,	100	94	94	52	70	100	100	50	75	100	100	100
Company C,	100	100	100	100	100	100	100	100	100	100	100	100
Company D,	100	94	100	64	94	88	100	75	100	50	100	50
Company E,	100	100	100	100	100	100	100	100	75	100	100	100
Company F,	100	100	100	100	100	100	100	100	100	100	100	100
Company G,	100	100	100	88	88	100	100	100	100	100	100	100
Company H,	100	94	82	82	94	82	100	100	100	100	100	100
Company I,	100	100	76	100	100	100	100	100	100	100	100	100
Company K,	100	100	100	100	100	100	100	100	100	100	100	100
Hospital Corps,	100	100	100	94	100	100	100	100	100	100	100	100
Signal Corps,	100	100	100	100	100	100	100	100	100	100	100	100
M.-G. Platoon,	100	100	100	94	100	100	100	100	100	100	100	100

SECOND REGIMENT.

	INSPECTION OF QUARTERS.						POLICING.					
	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Band,	82	82	100	94	82	94	100	50	100	100	100	100
Company A,	100	100	100	100	100	100	100	100	100	100	100	100
Company B,	88	100	88	100	100	94	100	100	100	100	100	100
Company C,	88	100	88	100	100	100	75	100	100	100	100	100
Company D,	100	100	100	100	100	94	100	50	100	100	100	100
Company E,	22	100	70	70	94	100	75	75	100	100	100	100
Company F,	76	88	100	94	100	100	50	100	75	100	100	100
Company G,	94	100	100	88	100	76	75	100	100	100	100	100
Company H,	100	100	100	100	100	100	100	100	100	100	100	100
Company I,	82	100	88	70	100	100	75	100	75	100	100	100
Company K,	76	100	100	100	100	94	50	100	100	100	100	100
Hospital Corps,	100	100	100	100	100	100	100	100	100	100	100	100
Signal Corps,	100	100	100	94	100	100	100	100	100	100	100	100
M.-G. Platoon,	100	100	100	100	100	100	100	100	100	100	100	100

THIRD REGIMENT.

	INSPECTION OF QUARTERS.						POLICING.					
	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Band,	....	88	100	100	100	100	100	100	100	100	100	100
Company A,	34	94	82	94	100	100	50	100	100	100	100	100
Company B,	76	100	100	100	100	100	100	100	100	100	100	100
Company C,	100	100	100	100	100	100	100	100	100	100	100	100
Company D,	100	100	100	100	88	100	100	100	100	100	100	100
Company E,	82	100	100	100	100	100	100	100	100	100	100	100
Company F,	76	34	88	94	94	100	75	100	100	100	100	100
Company G,	100	100	100	100	100	100	100	100	100	100	100	100
Company I,	100	100	100	100	94	100	75	100	100	100	100	100
Hospital Corps,	100	100	100	100	100	100	100	100	100	100	100	100
Signal Corps,	94	100	100	94	100	100	100	100	100	100	100	100
M.-G. Platoon,	100	100	94	100	100	100	100	100	100	100	100	100

FOURTH REGIMENT.

	INSPECTION OF QUARTERS.						POLICING.					
	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
Band,	64	82	94	100	100	100	100	100	100	100	100	100
Company B,	68	72	22	52	72	82	100	100	100	100	100	100
Company C,	82	70	82	100	100	100	100	100	100	100	100	100
Company D,	34	40	10	16	64	70	100	75	50	100	50	100
Company E,	34	16	88	70	82	64	100	75	50	100	100	75
Company F,	70	72	58	76	70	94	100	100	75	100	100	100
Company G,	40	22	28	76	94	82	100	100	75	100	100	100
Company I,	72	70	70	28	52	100	100	100	100	100	100	50
Company K,	82	70	94	94	100	100	100	100	100	100	100	100
Hospital Corps,	....	94	....	...	....	100	100	100	75	100	100	100
Signal Corps,	88	88	....	94	100	100	100	100	75	100	100	100
M. G. Platoon,	88	100	100	100	100	100	100	100	75	100	100	100

SEPARATE COMPANIES AND BATTERY A.

	INSPECTION OF QUARTERS.						POLICING.					
	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.
First Separate Co.,....	22	52	100	82	82	100	75	100	100	100	100	100
Second Separate Co.,...	22	82	46	94	94	100	75	100	100	100	100	100
First Platoon,.........	94	82	94	88	82	94	100	100	100	100	100	100
Second Platoon,........	70	70	88	94	94	94	100	100	100	100	100	100

GUARD MOUNTING.

From the reports received from the same staff of inspectors the ceremony of guard mounting, while performed better than last year, still lacks very materially of being well done. More attention needs to be paid to the details of this important ceremony. The non-commissioned officers are poorly instructed both as to their duties at guard mount and on guard. Until we see the schools for non-commissioned officers established throughout the Brigade, I presume it is hopeless to look for very much improvement. The same criticism which I made last year in regard to the general custom of putting recruits on guard holds good this year, and I will repeat the suggestion I made last year, viz.: "I would therefore respectfully suggest that hereafter no men be detailed for guard duty unless they have been in the service one year.".

DRILLS AND PARADES.

The published Routine was adhered to for the week with the exception of the half day spent by each organization in a tour of outpost duty. The skirmish drill was faithfully drilled both in company and in battalion, and showed that the majority of the officers of the Brigade have become well schooled in this important branch of the tactics. The parades of ceremony were quite in keeping with the record of former years, and leave little to be desired. The innovation of the Signal Corps making practical use of the bicycle, both in drill and for work, showed conclusively that this machine must become an important adjunct to our military service. Its capabilities are extensive, and I feel sure that this is but the beginning of its being put to more extended service not only in this but in other arms of the service.

DISCIPLINE.

I am intensely gratified to be able to report a marked improvement in the discipline of the Connecticut National Guard. In the matter of salutes, there was a pleasant increase. Still there is much work to be done by the company officers in instructing the enlisted men both as to the necessity of saluting and the proper method of salute. The general appearance of the men passing about the parade ground when off duty was markedly improved over any previous encampment. The order in the camp on the whole was good. This being the first year that the Brigade had ever encamped for a Sunday, it was with some misgivings that Sunday was looked forward to; but I can truthfully say that the order and discipline in the camp on that Sunday was all that the most punctilious could ask for, and obtained for the Brigade words of the highest commendation from military officers from other States who were on the ground, as well as from the clergy and many citizens of our own State.

PROVOST GUARD.

In addition to my other duties I acted as Provost-Marshal for the week. Lieutenant William B. Bristol, Co. K, Fourth Regiment, was detailed as Senior Officer of the Provost Guard, with Lieutenant O. L. Bradley, Co. I, Second Regiment, as his Junior. Lieutenant Bristol proved a most faithful and energetic officer, and I do not feel that I am casting any reflections on the officers of former years when I say that I believe that the Provost Guard never did such good and faithful work as was done in Camp Watson. Obtaining an increase in the number of men allowed me, I was able to have a day guard established in the village and at the railroad station, and I am informed by citizens of New London that never in the history of Niantic encampments were so few men to be seen on the streets of that city wearing the Connecticut uniform. On two occasions I was obliged to supplement the regular guard for a few hours on the rear of the camp to prevent a general running of the guard at that point. I regret exceedingly that owing to the peculiar political situation in the State no legislation for the benefit of the National Guard could be obtained last winter. I had hoped to see a strong high tight fence built along the northern boundary of the camp ground. To my mind it is an absolute necessity that it be done before another encampment is held, and I sincerely trust that the Quartermaster-General's Department may raise a sufficient appropriation for that object before the troops again occupy the ground.

I must again refer to the unmitigated nuisance of the crowd of hucksters, fakirs, and cheap showmen who annually congregate at the entrance of the camp grounds. I sincerely trust that some power may be legislated to the commander of the Brigade so that he can control that nuisance, and thus take away from the Encampment of the Connecticut National Guard that cheap element of a country fair.

I am very respectfully,
Your obedient servant,
PHINEAS H. INGALLS,
Major and Brigade Inspector, C. N. G.

Report of Major Charles L. Burdett, Brigade Engineer and Signal Officer, C. N. G.

HARTFORD, CONN., November 24, 1891.

Brigadier-General THOMAS L. WATSON,
Commanding Brigade Connecticut National Guard.

SIR:

I have the honor to submit the following report of duty performed at Camp Watson from August 15 to 24, 1891:

As a preliminary of duty in the field, I prepared under your orders a map of the State Military Rendezvous and vicinity, and blue print copies for the use of the several battalion commanders in a tour of outpost duty.

This outpost duty being one with which all the officers in the brigade should be fully conversant, so far as the theory and details are concerned, and in which many had had practice in the two years previous, it was thought best to indicate to each battalion commander simply the location of the line of resistance, and the extent of front to be protected, leaving all details of formation to such commanders in the performance of the tour of duty.

As at present organized the Connecticut National Guard has no cavalry or other mounted arm of service available for outpost and messenger duty, and it was decided to make a test at this encampment of 'cyclists or mounted infantry for such purpose. The Signal Corps was selected as an available branch, and from inquiries made of each of the several commanders it was learned that four of the Fourth Signal Corps were skilled in the use of the bicycle, and that all of the First Signal Corps were so skilled. The men in this corps at once expressed a willingness to devote the needed time for extra drill and instruction. They were each fitted out with a cushion-tired safety bicycle furnished by the Hartford 'Cycle Company, and with repeating carbines and revolvers, furnished by the Colt's Patent Fire Arms Manufacturing Company.

The distance from Brigade Headquarters at Bridgeport to the State Military Rendezvous at Niantic is about sixty-four miles by road; this distance was divided into six even sections, and the 'cyclist signalmen were designated to carry a message over each section, starting from Bridgeport. This duty was to be performed on Saturday morning, August 15th, the Fourth and First Signal Corps furnishing the men for the duty. The severe rain storm of Friday night and Saturday morning prevented this carrying of the message by relays of wheelmen, and for the time that part of the experimental test was abandoned.

ENGINEERING.

The only service in camp relating to this branch of my duty was performed on Monday and Tuesday, August 17th and 18th. On these two days, the several regiments, beginning with the Third, performed a tour of outpost duty, covering a line of resistance at about a mile west of camp, and over a front extending about a mile from right to left. In each case, after the pickets or sentinels had been established, an attack was delivered against the front by a force sufficient to indicate an actual attack. This attacking force was each day under my command, and was composed mainly of the two Separate Companies and a Gatling gun. About twenty-four hours' notice of the duty was given to each regimental commander, and that part of each regiment that was available for drill took part in the manœuvres, the force marching directly from the camp, and being single organizations, without any special guard mount.

It was evident in these manœuvers that careful instruction in grand guard and outpost duty is urgently needed before attempting its performance in actual service. A line of sentinels was established in each case that, in a measure, protected the front, but the dispositions were in many cases ill advised, in view of the nature of the ground to be protected. The manœuver, however, was of great practical benefit as practice in skirmish drill after the attack was delivered, and in exercising the commissioned and non-commissioned officers in the command of men who were more or less excited by the confusion of the firing, and the rapid movement and changes of formation incident to such contests. In a few instances, notably the work of Co. C, Fourth Regiment, the company commander showed commendable knowledge and skill in the disposition and handling of the forces for the defense of a bridge or like position. In too many instances, however, the function and power of a field piece, of a Gatling gun, or of the Springfield rifle, were entirely overlooked, and the bodily presence of a force on a point to be protected, as a bridge, or in a roadway, was thought by the company commander to be necessary in order to protect such bridge or roadway.

Such manœuvers are, however, of value, and by proper instruction given during the drill season, can be made of inestimable benefit to officers and men by practice in the field during the annual encampment of the Connecticut National Guard.

SIGNAL CORPS.

As in previous years the camp was in direct telephonic communication with all important points outside of camp, and was also provided with a special camp line connecting Brigade Headquarters with departmental and regimental headquarters; and there was also a special line for the use of the Quartermaster-General's Department. The latter lines were put up and instruments were mounted and put in before August 15th, under the direction of Lieutenant Giddings, First Signal Corps. Beginning with Saturday, and continuing during the encampment, the duty of taking care of the instruments and lines devolved upon the several signal officers and their commands.

The State camp ground at Niantic has a parade of about 2,200 feet in length from east to west, and of about 600 feet from north to south, for the greater part of the length, broken by one or two deep depressions, and slightly rolling as to the rest of the surface. The roads in the vicinity are, for the greater part, hilly and sandy and poor, with side paths furnishing good riding for limited distances, except in the village near the camp. As each member of the Signal Corps is instructed in the school of the soldier and of the company, in skirmish drill and guard duty, as a preliminary to his instruction in special duty as a signalman, the main task, so far as the use of the wheel was concerned, was to secure uniformity in mounting and dismounting, and in the several evolutions on the wheel. The preliminary drills in this regard were sufficient to enable the First Signal Corps to make a commendable appearance as 'cyclists in all regards.

In the performance of his regular duty, a signalman is called upon at camp to patrol about 6,000 feet of line of telephone wires, to examine the line and the instruments connected up along it, for the purpose of maintaining the whole in proper working order, and in addition to this they are sent out of camp to various distances to establish stations on the surrounding hills, from which stations messages are sent in order to test the proficiency of the men in such duties.

During the tour of outpost duty of the several regiments, the Signal Corps attached to that regiment had a line of communication established from the front to camp for the purpose of flagging messages, and one or more wheelmen were also assigned as special couriers to transmit any message from the front to camp. On four different occasions a wheelman was used as a courier to deliver a message from the outpost line to General Watson in camp, and the message was carried a distance varying from a mile and a half to two miles. The average time consumed in the transmission of the message was six minutes, and within ten minutes from the time the message was delivered to the signalman at the front, an order was delivered to Captain Fowler at the Battery, and a piece of artillery sent rapidly to the front, the wheelman preceding it and acting as a guide, easily keeping in advance of the gun, and thus making sure of its arrival at the desired place. In no instance was a message delivered in camp by use of flags or visual signals in advance of the wheelman, but from three to ten times the time was consumed in flagging the message that was required by the 'cyclist signalman to deliver it.

This courier service was performed by details from the First and Fourth Signal Corps, Lieutenant Burns having four of his men mounted as wheelmen.

For the purpose of testing the wheelmen as mounted infantry, the First Signal Corps was sent out from camp across open and broken country and along a beach, climbing steep banks, and crossing rough fields without inconvenience. They were tested in skirmish drills, the men dismounting from their wheels at a given signal, moving to the front, deploying and firing as skirmishers, rallying by fours and by company, and rallying on the wheels that were turned upside down, and used as a defense from behind which the men fired. At a given signal the men mounted the wheels and moved rapidly to the rear, by the flank, or to the front, no difficulty being experienced in changing front or from line to column formation.

On Thursday morning, on the camp ground, a small force of cavalry, consisting of volunteers from the staffs of the several battalions, was formed, and this, in connection with a detail of infantry from the First Separate Company, was used in field exercise against the First Signal Corps as 'cyclist infantry. The infantry was deployed as skirmishers in a hollow about three hundred yards from the east end of the camp ground, and as soon as the Signal Corps moved into sight in column at the extreme east end of the camp ground, fire was opened upon it. The wheelmen advanced in single file, formed into line, moved to the front, dismounted, deployed as skirmishers, and opened fire lying down. They moved by a succession of rushes towards the front, and dislodged the infantrymen who retired about a hundred yards into another hollow. At this point the calvary made an attack starting from the extreme west end of the camp ground, some six hundred yards away. This attack was repulsed by the wheelmen rallying on their wheels, inverting them and delivering from behind them as a defense a rapid fire from the magazine rifles with which they were armed. The cavalry swung to the right and returned to the west end of the camp, retiring in rear of the quarters. As soon as the cavalry had been driven back, the wheelmen again moved to the front, deployed, and opened fire upon the infantry in their second position. While they were thus deployed and engaged with the infantry, the cavalry delivered another attack, coming down on the right flank of the Signal Corps from the front, and driving the wheelmen back to their wheels. Owing to lack of practice the wheelmen could not mount quickly enough to enable all to escape, although several got away in advance of the horses. It was noticed that the wheelmen could make an extremely short turn, and so quickly as to cause the advancing horseman to run by, so that if the wheelman had escaped a sabre stroke he had the cavalryman at a disadvantage by the use of the revolver with which each wheelman was armed.

This exercise was simply to test, although in a somewhat crude way, the wheelmen as 'cyclist infantry, and the result of this experiment showed that the wheel offered some facilities as a defense, and also as a means of rapidly withdrawing from combat.

In my opinion, there is no question as to the desirability of mounting the Signal Corps as such on wheels so that they may be used as mounted messengers, as well as for their other duties. In any country having roads at all useable a mounted signalmen is enabled to move rapidly from place to place, and for long distances without great fatigue, for the purpose of establishing stations through which messages may be sent, for patroling and examining telephonic and other lines of communication, or the condition of roads and bridges, and also as couriers and mounted messengers for short distances, or even for long distances, where it is inadvisable to display visual signals. In all these duties the wheel offers altogether the best means of transportation yet devised. Careful estimates have been made of the relative expense of maintaining a 'cyclist and a cavalryman for one year, and these expenses have been stated as $15 per year for the 'cyclist, against $225 per year for the cavalryman.

As a result of the test of the wheel in military service, I am of the opinion that it offers a most convenient and effective means of transportation for armed men, either to points where certain forces are to be concentrated in mobilization, or for use in sudden attacks on the flanks, in the rear, or on lines of communication of an opposing force. The 'cyclist certainly is capable of making a much more rapid march than other arms of the service, as his capability has been tested in tactical marches and found to range from a minimum of thirty-two miles to a maximum of sixty-four miles in a day of eight hours. It was found that the wheelman possesses peculiar advantages, and is of the utmost value on outpost duty, used with cavalry or with infantry, or with both the other arms. So far as this experiment made by the Connecticut National Guard is concerned, it certainly has shown the desirability of the State taking some steps to enable it to utilize when need demands this modern form of transportation for a certain part of its trained militia; while as to the result of the test with regard to the special arm, the Signal Corps, there is not the slightest doubt but what the proper form of mount has been realized to give to that corps all the mobility, rapidity of movement, and power of attack and defense that is needed to place the corps in a most efficient state for all the duties that it may be likely to be called upon to perform.

I would respectfully call your attention to the fact that the Signal Corps are not properly equipped with means of even learning the duty that they are called upon to perform. The State has provided simply kits with flags for each corps, and one set of two torches for night work for the use of all the corps. Each corps should be properly equipped with heliographs, and with means for signaling with flash-light. Very imperfect substitutes for the proper instruments are improvised by several of the corps, all of the members being eager and willing, and even anxious, to give to their work all the time that may be needed to acquire the proper efficiency in their duties that are of the utmost importance and should not be longer neglected by the failure to supply proper equipments.

Each of the several signal corps reported for duty at camp with their full complement of men.

SEACOAST BATTERY.

As in several years last past, the instruction of the details in heavy artillery practice was under my direction. The details from the several regiments were instructed in heavy artillery drill at the battery by Sergeant John R. Cashman of Battery C, Second U. S. Artillery, who was detailed at your request for this purpose.

Each detail comprised one man from each company in the several regiments, and the drills were had in the morning and afternoon at the hours assigned for general battalion drill. A report of this duty was made to me each evening by Sergeant Cashman, and in addition to such reports, I personally visited the battery during the drill hours, and noted the manner in which the drills were conducted. The instruction included the manual of the piece, loading and firing blank charges, and also in target practice with shells made of plaster-of-paris that were fired with a charge of about twenty-four ounces of powder, and with a bursting charge of about six ounces. These plaster shells are similar to those that have been used during the past three or four years, and they have provided a proper substitute for iron shells.

As a rule the detachments reported promptly, all the men were attentive, eager to learn, and made good progress.

The system of instruction by details from the several commands is the best probably that can be adopted under the present system in view of the fact that all of the several regiments are infantry, and are instructed and drilled as such. In my opinion, this matter of instruction in heavy artillery practice, and the proper organization of the Connecticut National Guard for such purpose is a measure that should receive immediate attention of the authorities.

Accompanying this report is a copy of the map showing the layout of Camp Watson with all the permanent buildings and tents as erected, and also another map showing the camp and vicinity, such as was used in connection with outpost duty.

Very respectfully,
Your obedient servant,
CHARLES L. BURDETT,
Major and Engineer and Signal Officer, C. N. G.

REPORT OF CAPTAIN D. S. LATHROP, COMMANDING FIRST SEPARATE COMPANY.

BIRMINGHAM, CONN., June 1, 1891.

Colonel JOHN B. DOHERTY,
Commanding Second Regiment, C. N. G.

SIR :

In accord with your request, I forward sketch of work done by my command on May 20, 1891. Fell in for work at 8 o'clock A.M. Held one hour and three-quarters' drill in battalion movements. Battalion commanded by First Lieutenant Tilghman. Battalion composed of three companies commanded by second lieutenant, first and second sergeants.

Left armory at 10 A. M., still in battalion formation, commanded by First Lieutenant. Marched to point near Orange street bridge near East Rock. Took company formation, threw out scouting party to examine and report on passage of bridge ; passed bridge ; formed as patrol for offense ; scouted to crest of East Rock ; broke ranks. Signal shots at Quinnipiac Range. Company double-quick from monument to range, and throw out skirmish line in eight and three-quarter minutes ; no man left on road ; dinner. Fall in for outpost ; main guard placed ; small posts set ; sentinels posted (Butterworth system). Lesson 1st, receiving the flag of truce ; 2d, testing the patrol. Outpost dismantled ; company relieved and ranks broken ; rifle practice for fourth class only. Fall in, company formation ; march to armory. Arrive at armory at 6.20 P. M. Dismissed.

Very respectfully,

D. S. LATHROP,

Captain Commanding First Separate Company, C. N. G.

[4.]

REPORTS OF COMMANDING OFFICERS GOVERNOR'S GUARDS.

Report of Major E. Henry Hyde, Jr., commanding First Company Governor's Foot Guard.

HEADQUARTERS GOVERNOR'S FOOT GUARD,
HARTFORD, CONN., Nov. 25, 1891.

Brigadier-General ANDREW H. EMBLER,
Adjutant-General State of Connecticut.

GENERAL:

In accordance with your instructions I have the honor to report in behalf of this command for the year 1891, as follows:

1. Number of commissioned officers, 6; enlisted men, 106; total, 112; being an increase of 18 since one year ago.

2. Spring field day, May 30th. The morning was devoted to drill, and in the afternoon, as has been the honored custom for many years, the command paraded as escort to the Union Veterans for their Memorial Day exercises. Present, 77 men.

3. Special parade, June 10th, as escort to the Grand Army Posts and other organizations, upon the occasion of the dedication of the Memorial Hall at Windsor Locks. Present, 55 men.

4. Special parade, July 4th, at Hartford, in celebration of the day. Present, 56 men.

5. September 28th and 29th, an excursion to Albany. Present, 61 men. The command was right royally received and entertained by the old and famous Burgesses Corps, Major James Otis Woodward commanding. A reception was given them by the Burgesses Corps on the evening of the 28th, at which were present most of the State officers, the Mayor and city officials, General John Palmer, Commander-in-chief of the Grand Army of the Republic, and many distinguished citizens of Albany. In the afternoon of the 29th, after a short street parade, the command was specially received by His Excellency Governor Hill in the Executive Chamber. I cannot speak too highly of the cordiality of the reception and entertainment, and

am pleased to report that the members of the company, by their gentlemanly conduct and soldierly bearing, fully maintained the high reputation of the Guard.

6. Fall field day, September 19th. Present, 104 men. The forenoon was advantageously employed in drill and target practice, followed by a street parade in the afternoon. The new white trousers and vests were worn for the first time at this parade, and the Guard in their new uniforms, combined with their fine marching and full ranks, presented an unusually creditable appearance. The parade was followed by religious services at St. John's Church, in accordance with the usual custom, where the annual sermon was preached by Rev. Mr. George R. Warner, and in the evening the annual banquet took place at the armory. As this occasion was the one hundred and twentieth anniversary of the organization of the Guard, it seems not inappropriate to call attention to the fact that this command, organized in 1771, is the oldest military organization of continuous existence in the United States. It has not missed an annual parade in all that period, and has participated in the inauguration of every governor of this State. It has borne a conspicuous part upon many occasions of historical interest, and has performed escort duty for many distinguished personages, probably more than any other organization in the country, notable among which are escorts on two different occasions during the Revolution for Washington, Knox, LaFayette, Admiral Tierney, and Count de Rochambeau, upon the occasion of their visits to Hartford and Wethersfield. It has done escort duty for Presidents Washington, John Adams, Monroe, Jackson, Polk, Johnson, Grant, and Harrison. Memorable among the occasions of historical importance in which it has participated are the Peace Celebration of 1815, the Centennial of the Battle of Saratoga in 1877, the New York Evacuation Day Centennial in 1883, the dedication of the Washington Monument in 1885, the funeral of General Grant, August 8, 1885, the Centennial of the adoption of the Constitution in Philadelphia, September, 1887, the Centennial of the inauguration of Washington at New York in 1889, and nearly every local event of any historical importance.

7. I cannot conclude this report without referring to the irreparable loss which occurred to this command in the death of the late Major John C. Kinney, who was commissioned as Major Commandant of the company, January 30, 1882, and died while yet in command, April 22, 1891. During his command, and largely owing to his exer-

tions, the company built for itself its present armory at an expense of about $60,000, and attained a chief place among the military organizations of the country. I desire to bear my testimony to his high character as a soldier and a gentleman, and to his most valuable services to this command.

I have the honor to remain, very respectfully,

Your obedient servant,

E. HENRY HYDE, Jr.,

Major commanding First Company Governor's Foot Guard.

Report of Captain Joseph J. Wooster, commanding Second Company Governor's Foot Guard.

HEADQUARTERS SECOND COMPANY GOVERNOR'S FOOT GUARD,
NEW HAVEN, November 24, 1891.

Brigadier-General ANDREW H. EMBLER,
Adjutant-General State of Connecticut.

GENERAL:

In accordance with your instructions, I have the honor to report the following regular and special parades and drills of this command during the year 1891:

First. Annual spring parade, May 30, 1891. The morning was devoted to company and skirmish drill, and in the afternoon the command paraded with the other military bodies in the city, as escort to the Grand Army of the Republic in the exercises of "Memorial Day."

Second. Annual fall parade, October, 1891. Morning devoted to skirmish drill, and afternoon to rifle practice.

Third. Total number of drills during the year, 29. This does not include the monthly meetings when no drills are held.

Fourth. Present status of the company, 3 officers, 50 enlisted men. There has been a gain of 5 men during the year.

Fifth. The company has not, at the present time, enough uniforms to supply the men enlisted, and while the charter allows them as a full quota 6 officers and 112 men, owing to inability to supply uniforms enlistments have been stopped; this, because of lack of an appropriation.

I beg to present as a part of this report, a brief synopsis of the history of the Second Company Governor's Foot Guard.

It was organized March 2, 1775, pursuant to a call for the formation of a military company in New Haven, which call was signed by sixty-five of the most prominent men of the day, and was officered as follows:

Captain Benedict Arnold.
Lieutenant Jesse Leavenworth.
Ensign Hezekiah Sabin, Jr.

Since that date, the organization has had an unbroken record of service. The first uniform of the company was a scarlet coat with buff trimmings, white vest, ruffled shirt, knee breeches, and white silk stockings, Continental hat.

The first duty of importance performed was upon receipt of the news of the battle of Lexington, when they marched, April 20, 1775, with the intention of participating in the conflict there inaugurated. Upon arrival at Cambridge they were detailed, on account of their appearance in complete uniform and their especially soldierly discipline and actions, to deliver the body of a British officer, who had died while a prisoner in the hands of the American army, to the British troops, and were by them complimented highly, as being not excelled by any company in the British army. The larger part of the company shortly returned to Connecticut, but a number remained and went with the forces under Arnold on the expedition to Ticonderoga.

The command has taken part in more historic events than this report permits other than brief mention of.

Beside its regular spring and fall parades, the company has been a part of all local celebrations since organization. It has performed escort duty to General Washington, and many other distinguished visitors to New Haven. It sent many men to the front in the late war; its roll of honor is by no means a limited one. In later days it has taken part in many notable events. 1870, with the city companies of the Second Regiment, it broke up a prize fight on Charles Island, Long Island Sound, capturing many of the gang present. 1879, the command participated in the escort of the survivors of the Connecticut Volunteer Regiments when they deposited their tattered battle-flags in the place prepared for them at the new State House in Hartford. In 1881, the Second Company Governor's Foot Guard was, with the First Regiment, C. N. G., designated to represent Connecticut at the Centennial celebration of the surrender of Cornwallis at Yorktown, Va., visiting Fortress Monroe, Va., and Charleston,

S. C., on the trip, gaining commendation for soldierly bearing and discipline. 1883, the command took part in the Centennial celebration of the evacuation of New York by the British. 1887, the company had a prominent position in the parade dedicating the Soldiers' Monument in New Haven.

The command has always been one of the first to report for duty in the interest of the public good, and it has always been conceded that if military aid or defense was needed, the "Second Company Governor's Foot Guard" could be counted on to a certainty.

Respectfully, your obedient servant,
JOSEPH J. WOOSTER,
Captain commanding Company.

Report of Major Wm. G. Hubbard, commanding First Company Governors' Horse Guard.

HEADQUARTERS FIRST COMPANY GOVERNOR'S HORSE GUARD,
HARTFORD, CONN., November 23, 1891.

To Brigadier-General ANDREW H. EMBLER,
Adjutant-General, State of Connecticut.

GENERAL:

Agreeable to your request, I prepare the following report:

The First Company Governor's Horse Guard was organized May 8, 1778. The present officers are, Major Wm. G. Hubbard, Captain Francis M. Warren, Lieutenant Henry D. Clark, Cornet Wm. W. Whitehead, and Quartermaster Joel C. Taft.

On Dec. 1, 1890, the company consisted of 5 commissioned officers, 9 non-commissioned, and 4 staff officers, together with 55 privates; total, 73 members.

Number of field days two; dates of same May 22d and October 16th. One prize drill, May 28th, for a gold medal or badge, presented to the successful competitor by the company; in this instance won by Orderly Sergeant Horace L. Carter. There were thirty-eight regular drills.

In accordance with S. O. No. 98, A. G. O., dated Aug. 16, 1891, a detail of a sergeant and four men, was sent to Camp Watson for orderly and escort duty at general headquarters, during the eight days' encampment of the State militia, which commenced Saturday, August

15th. The names of those composing the detail were Sergeant Elizur W. Goodrich, Privates Frederick W. Mansur, Gilbert P. Hurd, Chas. C. Martin, and Edward E. Crane; a sixth man, Goodrich H. Fulton, was sent by the company as an alternate.

At Fall field day, October 16th, Frank D. Copeland, in the target shoot, won a gold badge given by the commissioned officers to the non-commissioned officer or private making the best score at fifty yards with Colt's revolver. Private Copeland's score was 26 out of a possible 30. There were several others very close to that mark.

Nov. 23, 1891, the command consists of 5 commissioned officers (no staff), 9 drill, quartermaster, and color sergeants, 3 corporals, and 52 privates, a total of 69 members, making a loss of 4 enlisted men during the year. Ex-Major Frank Cowles and Quartermaster J. C. McClure resigned during the year. The average of attendance at drills was larger than the year previous, being 40.54 against 30.54.

All of which is respectfully submitted,

WM. G. HUBBARD,

Major Commanding First Company Horse Guard.

Report of Major D. A. Blakeslee, commanding Second Company Governor's Horse Guard.

HEADQUARTERS SECOND COMPANY GOVERNOR'S HORSE GUARD,
NEW HAVEN, CONN., November 25, 1891.

Brigadier-General ANDREW H. EMBLER,
Adjutant-General, State of Connecticut.

GENERAL:

I have the honor to report that this command has during the past year made parades as follows:

Regular ordered spring parade, May 20, 1891, present, officers, 6; men, 53; total, mounted, 59. Regular ordered fall parade, Oct. 15, 1891, present, officers, 7; men, 57; total, mounted, 64. Special parade escort to G. A. R., May 30, 1891; dismounted. Special parade, July 2, 1891; dismounted.

The present membership of the company numbers 70. Commissioned officers, 7; non-commissioned officers, 16; privates, 47; total, 70, a gain of 10 during the year.

Twenty-four drills have been held since Dec. 1, 1890, with good attendance and beneficial results. The command is in a prosperous condition with good prospects of advancement in drill and membership. The company is fairly well equipped for the present number of members, with the exception of saddles and bridles, which should be repaired. With an additional number of uniforms the company could be considerably increased in membership by the enlistment of good men. At one time a check was placed on enlistment as the supply of uniforms that were suitable were nearly exhausted.

D. A. BLAKESLEE,
Major commanding Second Company Governor's Horse Guard.

[5.]

REPORT OF EXAMINING BOARD.

New Haven, Conn., May 20, 1891.

Brigadier-General Andrew H. Embler,
Adjutant-General, State of Connecticut.

General:

In accordance with General Orders No. 9, dated Adjutant-General's Office, Hartford, Conn., April 23, 1891, the Examining Board, thereby appointed, convened at Headquarters' Room, Second Regiment Armory, New Haven, on Tuesday, May 12, 1891, and afterwards at said place and hour on Thursday, May 14th, Friday, May 15th, and Tuesday, May 19, 1891, and having made a thorough examination, and strictly in accordance with Section 4, Article XXV, Regulations, C. N. G., 1884; especial attention being given to guard duty and skirmish drill, of all officers appearing before it, said Board begs leave to report the following named officers as having passed a satisfactory examination, viz.:

FIRST REGIMENT.

Major John Hickey.
Captain Martin Laubscher.
Captain Charles L. Bissell.
Captain Charles H. Slocum.
First Lieutenant William C. Herter.
First Lieutenant Edwin L. Bolles.
First Lieutenant Charles H. Patterson.
First Lieutenant Charles H. Moore.
First Lieutenant Henry H. Saunders.
Second Lieutenant Harry M. Loomis.
Second Lieutenant John E. Lynch.
Second Lieutenant Louis N. Mansuy.
Second Lieutenant Wesley B. Porter.
Second Lieutenant Joseph R. Andrews.
Second Lieutenant Edward H. Waterman.

SECOND REGIMENT.

First Lieutenant FREDERICK L. LEHR.
First Lieutenant EDWARD V. REYNOLDS.

THIRD REGIMENT.

First Lieutenant FREDERICK FARNSWORTH, Paymaster.
First Lieutenant JULIAN LA PIERRE, Assistant Surgeon.
Captain THOMAS O. THOMPSON.
Captain HENRY J. THAYER.
First Lieutenant HENRY S. DORSEY.
First Lieutenant DAVID CONNER.
First Lieutenant SAMUEL PRINCE.
Second Lieutenant JEREMIAH DILLON.
Second Lieutenant WILLIAM R. BEACH.
Second Lieutenant CHARLES A. MINOR.
Second Lieutenant HENRY L. STARR.

FOURTH REGIMENT.

Captain EDWARD FINN, Inspector of Rifle Practice.
First Lieutenant WILBUR S. WATSON, Assistant Surgeon.
Captain CARROLL D. RYDER.
Captain GEORGE T. JEWELL.
First Lieutenant HERMAN M. ERIKSSON.
First Lieutenant CHARLES N. PARSONS.
First Lieutenant WILLIAM B. BRISTOL.
Second Lieutenant MERRITT F. WHITE.
Second Lieutenant CHARLES W. HENDRIE.
Second Lieutenant EDWARD G. AIKIN.
Second Lieutenant JOHN V. SCOFIELD.
Second Lieutenant WILLIAM MAXWELL.
Second Lieutenant WILLIAM H. FRYER.

SEPARATE COMPANIES.

Captain EVERETT W. FREEMAN.
First Lieutenant WATKINS W. CHRISTIAN.

The following-named officers failed to pass a satisfactory examination, but for various reasons the Board respectfully recommends that they be allowed a second examination:

Captain LYMAN S. BURR, First Regiment.
Captain REUBEN M. ROSE, Fourth Regiment.
Second Lieutenant HENRY S. HAMILTON, Second Regiment.

The following-named officers failed to pass a satisfactory examination:

Captain George W. Metcalf, Third Regiment.
Second Lieutenant David Flagg, Third Regiment.

The following-named officer, upon his written request, duly approved, was excused from appearing for examination:

First Lieutenant Lucius H. Fuller, Third Regiment.

The following-named officer failed to appear for examination:

Captain George S. Rowe, Adjutant Fourth Regiment.

Respectfully submitted,

[Signed]
W. J. LEAVENWORTH,
THOMAS T. WELLES,
TIMOTHY F. CALLAHAN,
Examining Board.

[6.]

REPORT OF BOARD OF SURVEY.

HARTFORD, CONN., NOV. 24, 1891.

TO THE ADJUTANT-GENERAL,
State of Connecticut.

SIR :

Pursuant to *Special Orders Number* 136, *A. G. O.*, dated November 17, 1891, the undersigned, *a Board of Survey*, convened at the State Arsenal, Hartford, on Tuesday, November 17, 1891.

Before inspection the oath was administered in accordance with Article XXV, Section 6, par. 1865, Reg. C. N. G.

The Board then proceeded to inspect certain property of the State, reported to us by the Quartermaster-General's department as obsolete and unserviceable.

On account of darkness the Board adjourned at 5.15 o'clock P. M., to the 21st day of November, 1891, at 10 o'clock A. M.

The result of said inspection and our recommendations founded thereon, are as follows :

The following stores are worthless, and we recommend that they be dropped from the books :

6	Helmets.
6	Drum-sticks (pairs).
17	Knapsacks.
2	Canteens.
1	Storm flag (State).
2	Wall-tent flies.
4	Common tents (old "A").
3	Cartridge boxes.
14	Bayonet scabbards.
2	Bayonets (Peabody).
49	Waist-belt plates.
2,590	Rounds, 45-cal. ammunition.
360	" 50 " "
800	" blank "

	Lot of old leather hose (about 200 feet).
32	Blankets (all colors, very bad condition).

The following stores are obsolete, of no use to the service, and we recommend that they be disposed of, by sale or otherwise, to the best interests of the State, viz.:

1	First sergeant's chevrons (sets).
6	Sergeant's " "
6	Corporal's " "
2	Hospital steward's " "
5	Signal service devices "
73	Drums.
33	Drum cords.
36	" slings.
13	" covers.
1	" snares.
642	" hooks.
86	" ears.
37	" snare tighteners.
17	" flesh hoops.
23	" rim "

The following stores are unserviceable to the State, and we recommend that they be disposed of, by sale or otherwise, to the best interests of the State, viz.:

7	Uniform coats.
160	Pairs of trousers.
166	Blouses.
216	Forage caps.
2	Post flags (U. S. Government).
1	" (State).
4	National colors.
1	State color.
5	Guidons.
6	Marker flags.
1	Headquarter wall tent.
1	" " fly.
5	Wall tents.

66	Saddle cloths.
11	Waist-belt plates.
387	Magenta blankets.

(These blankets have been long in the service, color badly faded, badly stained; otherwise, they are in fair condition. Inasmuch as they are not needed, we recommend that they be sold.)

1	Storm flag (U. S. Government).
205	Light grey blankets.

(These blankets are of light weight, not heavy enough to issue to men, in good condition. We recommend they be sold.)

139 Grey blankets.

(These blankets are under size, badly worn, and practically unserviceable. We recommend they be sold.)

Respectfully submitted,

PHINEAS H. INGALLS,
Major and Brigade Inspector, C. N. G.
EDWARD SCHULZE,
Captain Company A, First Regiment, C. N. G.
ARTHUR M. LANE,
First Lieutenant and Quartermaster, First Regiment, C. N. G.

[7.]

GENERAL ORDERS, IMPORTANT SPECIAL ORDERS, AND CIRCULARS.

General Orders.

STATE OF CONNECTICUT.

Adjutant-General's Office,
Hartford, Jan. 21, 1891.

General Orders, }
No. 1. }

I. Changes as follows in the commissioned officers of the Connecticut National Guard have occurred since December 26, 1890:

RESIGNED AND DISCHARGED.

First Regiment.

First Lieutenant Henry F. Smith, Company A, January 7, 1891.
First Lieutenant Henry E. Chapman, Company H, January 15, 1891.

Third Regiment.

First Lieutenant John F. Murray, Company A, January 14, 1891.
Capt eorge M. Cole, Company I, January 20, 1891.

PROMOTED AND APPOINTED.

Third Regiment.

First Lieutenant Henry J. Thayer of Putnam, appointed Captain Company G, with rank from Dec. 11, 1890, *vice* Wright, resigned.

Lucius H. Fuller of Putnam, appointed First Lieutenant Company G, with rank from December 11, 1890, *vice* Thayer, promoted.

II. The following are announced as the figures of merit of each organization of the Connecticut National Guard for the month of December, 1890, based on the drill reports for the month:

FIRST REGIMENT.					SECOND REGIMENT.				
Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.	Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Jan. 1,	4	57	89.34	A.	Jan. 1, 2.00 P.M.	5	68	98.43
B.	Jan. 2,	5	67	86.57	B.	Jan. 7, 8.00 P.M.	4	63	94.90
C.	Jan. 5,	5	68	97.06	C.	Jan. 2, 9.00 A.M.	5	63	94.38
D.	Jan. 3,	6	63	89.61	D.	Jan. 1, 2.00 P.M.	5	68	98.73
E.	Jan. 3,	6	60	90.52	E.	Jan. 3, 9.00 A.M.	5	64	95.44
F.	Jan. 1,	4	64	92.83	F.	Jan. 2, 9.00 A.M.	4	59	92.20
G.	Jan. 1,	5	68	94.61	G.	Jan. 6, 11.00 A.M.	5	68	97.06
H.	Jan. 1,	4	65	88.27	H.	Jan. 5, 9.00 A.M.	5	61	90.56
I.	Jan. 3,	4	60	91.08	I.	Jan. 2, 9.00 A.M.	4	68	97.55
K.	Jan. 1,	4	56	89.95	K.	Jan. 3, 9.00 A.M.	4	61	93.29
1st Signal Corps.	Jan. 3,	4	10	100.00	2d Signal Corps.	Jan. 5, 11.30 A.M.	5	10	98.00
1st M.-G. Plat.	Jan. 2,	4	8	89.01	2d M.-G. Plat.	Jan. 15, 7.00 P.M.	4	36	93.52
Figure of merit of Regiment,				**91.57**	Figure of merit of Regiment,				**95.34**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Jan. 4, 12.00 M.	5	52	78.70
B.	Jan. 2, 11.00 A.M.	5	63	91.73
C.	Jan. 1, 6.00 P.M.	5	62	85.77
D.	Jan. 2, 11.00 A.M.	5	57	82.91
E.	Jan. 2, 9.00 A.M.	4	59	84.85
F.	Jan. 6, 9.00 A.M.	5	54	77.70
G.	Jan. 1, 6.00 P.M.	4	54	77.09
I.	Jan. 1, 9.00 A.M.	5	67	94.04
3d Signal Corps.	Jan. 1, 3.00 P.M.	5	9	87.90
3d M.-G. Plat.	Jan. 2, 9.00 A.M.	4	9	99.07
Figure of merit of Regiment,				**85.98**

FOURTH REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	Jan. 5, 8.00 A.M.	5	59	85.98
C.				
D.	Jan. 17, 10.00 A.M.	4	61	86.19
E.	Jan. 5, 8.00 P.M.	5	61	85.64
F.	Jan. 5, 8.00 A.M.	5	64	87.62
G.	Jan. 5, 8.00 A.M.	5	58	81.88
I.	Jan. 1,	5	60	91.64
K.	Jan. 5, 6.00 P.M.	5	58	83.03
4th Signal Corps.				
4th M.-G. Plat.	Jan. 3,	5	9	95.56
Figure of merit of Regiment,				**69.75**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Jan. 6, 9.00 A.M.	4	53	74.41
2d	Jan. 5, 9.00 A.M.	5	54	77.70

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Jan. 1,	3	25	73.66
2d	Jan. 3,	2	38	89.67
Figure of merit of Battery,				**81.67**

III. The publication of this order has been delayed by reason of non-receipt of corrected drill reports for month of December from Captain William F. Daniel, Company C, and First Lieutenant Frank M. Cogill, Fourth Signal Corps, Fourth Regiment, C. N. G.

IV. The figure of merit for month of November ultimo of each, First Signal Corps, First Regiment, and the First Regiment, C. N. G., as published in G. O. No. 26, 1890, are hereby corrected to 96.67 and **90.11** respectively.

By order of the Commander-in-Chief.

ANDREW .H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, Feb. 16, 1891.

GENERAL ORDERS,
No. 2.

I. With feelings of the most profound sorrow, the Commander-in-Chief announces the death of GENERAL WILLIAM TECUMSEH SHERMAN, which occurred at his home in New York City, at 1:50 P. M., on Saturday, February 14th, 1891.

The sad intelligence of this death will cause mourning in every patriot heart and home throughout the land. No General of the Civil War period won his way to a warmer place in the hearts of the American people, and none more fittingly than he bore the honors in time of peace of the highest rank known to our military establishment.

In bidding final farewell to this matchless soldier of the Republic, we can but rejoice that during a period of a quarter of a century after the close of his labors in the field of civil-strife, he was permitted to enjoy a peaceful life in the land he had so conspicuously helped to save.

II. The funeral services in New York City will be held on Thursday, 19th inst., the funeral cortege forming on Seventy-first Street, at 1 o'clock P. M.

Officers of the Connecticut National Guard desiring to attend the funeral services in New York will report to Brigadier-General, Thomas L. Watson, Commanding the Brigade, C. N. G., in full uniform, with side arms, at such time and place as he may designate.

III. On the day of the funeral, Thursday, 19th inst., a funeral salute of seventeen guns will be fired at the State Capitol in Hartford, at intervals of 30 minutes.

IV. From the date of this order until the close of the funeral exercises in St. Louis, the United States flag will be displayed at half-staff on the Arsenal in Hartford, and on all the public buildings of the State.

V. The Quartermaster-General is charged with the execution of firing the funeral salute.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, Feb. 18, 1891.

GENERAL ORDERS,
No. 3.

I. Changes as follows in the commissioned officers of the CONNECTICUT NATIONAL GUARD have occurred since January 21, 1891:

RESIGNED AND DISCHARGED.

FIRST REGIMENT.

Captain Amasa P. Dickinson, Company C, February 12, 1891.
First Lieutenant Frederick H. Linker, Company C, January 27, 1891.

THIRD REGIMENT.

Captain Frederick E. St. Clare, Company D, January 29, 1891.
Second Lieutenant M. Wilson Dart, Company D, January 29, 1891.

PROMOTED AND APPOINTED.

FIRST REGIMENT.

Quartermaster-Sergeant William C. Herter of Hartford, appointed First Lieutenant Company A, with rank from January 16, 1891, *vice* Smith, resigned.

Second Lieutenant Charles H. Patterson of Hartford, appointed First Lieutenant Company H, with rank from January 22, 1891, *vice* Chapman, resigned.

THIRD REGIMENT.

Second Lieutenant Henry S. Dorsey of New London, appointed First Lieutenant Company A, with rank from January 28, 1891, *vice* Murray, resigned.

Sergeant Jeremiah Dillon of New London, appointed Second Lieutenant Company A, with rank from January 28, 1891, *vice* Dorsey, promoted.

First Lieutenant George W. Metcalf of New London, appointed Captain Company I, with rank from January 27, 1891, *vice* Cole, resigned.

Second Lieutenant Samuel Prince of New London, appointed First Lieutenant Company I, with rank from January 27, 1891, *vice* Metcalf, promoted.

First Sergeant Charles A. Miner of New London, appointed Second Lieutenant Company I, with rank from January 27, 1891, *vice* Prince, promoted.

II. The following are announced as the figures of merit of each organization of the CONNECTICUT NATIONAL GUARD for the month of January, 1891, based on the drill reports for the month:

FIRST REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Feb. 2,	5	58	88.77
B.	Feb. 2,	4	65	84.68
C.	Feb. 4,	5	68	95.59
D.	Feb. 2,	4	66	89.93
E.	Feb. 2,	4	60	88.86
F.	Feb. 2,	3	63	89.61
G	Feb. 2,	4	68	96.08
H.	Feb. 2,	4	64	90.75
I.	Feb. 2,	4	63	94.38
K.	Feb. 2,	4	55	88.78
Hosp. Corps.				
	Feb. 4,	4	5	100.00
1st Signal Corps.				
	Feb. 2,	4	10	95.83
1st M.-G. Plat.				
	Feb. 2,	5	9	89.63
Figure of merit of Regiment,				**91.76**

SECOND REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Feb. 2, 11.00 A.M.	4	68	98.41
B.	Feb. 2,	4	63	94.38
C.	Feb. 3, 9.00 A.M.	4	63	95.96
D.	Feb. 2, 9.00 A.M.	4	68	98.28
E.	Feb. 3, 9.00 A.M.	4	67	97.02
F.	Feb. 5, 7.00 P.M.	4	64	97.00
G.	Feb. 3, 9.00 A.M.	4	68	97.55
H.	Feb. 5, 7.00 P.M.	4	63	91.20
I.	Feb. 2, 11.00 A.M.	5	68	96.57
K.	Feb. 5, 7.00 P.M.	5	62	94.37
Hosp. Corps.				
	Feb. 5, 7.00 P.M.	5	5	96.00
2d Signal Corps.				
	Feb. 2, 11.00 A.M.	4	10	99.17
2d M.-G. Plat.				
	Feb. 4, 9.00 A.M.	5	9	99.26
Figure of merit of Regiment,				**96.55**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Feb. 2, 3.00 P.M.	4	51	82.52
B.	Feb. 2, 9.00 A.M.	4	66	92.96
C.	Feb. 2, 3.00 P.M.	4	63	91.73
D.	Feb. 3, 10.00 A.M.	4	59	83.38
E.	Feb. 3, 9.00 A.M.	5	59	83.61
F.	Feb. 3, 9.00 A.M.	4	52	80.23
G.	Feb. 2, 5.00 P.M.	5	59	80.90
I.	Feb. 3, 9.00 A.M.	4	63	93.85
Hosp. Corps.				
	Feb. 2, 3.00 P.M.	4	5	98.33
3d Signal Corps.				
	Feb. 2, 3.00 P.M.	5	8	92.14
3d M.-G. Plat.				
	Feb. 1, 9.00 A.M.	5	9	100.00
Figure of merit of Regiment,				**89.06**

FOURTH REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	Feb. 4, 1.00 P.M.	4	59	84.85
C.	Feb. 4,	4	52	84.46
D.	Feb. 7,	5	61	86.73
E.	Feb. 4,	4	58	84.75
F.	Feb. 3, 10.00 A.M.	4	64	86.58
G.	Feb. 2,	4	60	84.41
I.	Feb. 3, 10.40 A.M.	4	59	91.07
K.	Feb. 10,	5	58	79.58
Hosp. Corps.				
	Feb. 3,	4	4	82.92
4th Signal Corps.				
	Feb. 5,	3	10	81.67
4th M.-G. Plat.				
	Feb. 2,	4	9	97.22
Figure of merit of Regiment,				**85.84**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Feb. 3, 3.00 P.M.	5	58	77.34
2d	Feb. 5, 9.00 A.M.	4	56	82.21

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Feb. 6,	2	23	70.87
2d	Feb. 4,	2	38	85.28
	Figure of merit of Battery,			**78.08**

III. The following-named members of the National Guard have been dishonorably discharged from the military service of the State, in accordance with sentences of Field Officers' Courts-Martial, viz.:

FIRST REGIMENT.

Company F.—Corporal Albert S. Chamberlin, Private Walter B. Griswold, Private James W. Dennis, Private Frank W. Theis, Private William T. Mather.

THIRD REGIMENT.

Company B.—Private Michael Roberts, Private John Duvall.

FOURTH REGIMENT.

Company G.—Private Albert C. Morgan, Private Arthur W. Tappan, Private John M. Gavin.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, February 25, 1891.

GENERAL ORDERS,
No. 4.

The following members of the National Guard are announced as having qualified during the season of 1890, as Sharpshooters, First-Class Marksmen, and Marksmen, in accordance with Article XXVII, Regulations C. N. G., 1884, and are awarded the State decoration, which is to be worn whenever the dress uniform is worn.

The letter "V" or "X" prefixed to grade in record of previous qualifications, or in "Designation 1890," indicates that year to have been the fifth (V), or tenth (X), qualifications.

Commanding officers will make immediate requisition for badges and bars for winners in 1890, as published in this order.

BRIGADE STAFF AND NON-COMMISSIONED STAFF.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Brig.-Gen. T. L. Watson	21	22	43	19	23	42	Sharps'r.	V s '86	s	s	s
Lt.-Col. L. N. Van Keuren	19	18	37	17	16	33	1st Cl. M.		..	..	V m
Lt.-Col. G. L. Porter, M. D.	17	15	32	16	13	29	Marksman.	..	m	m	m
Maj. C. L. Burdett, E. & S. O.	18	22	40	21	20	41	Sharps'r.	..	..	..	X s
Maj. P. H. Ingalls, Inspector.	19	10	29	18	16	34	1st Cl. M.	..	..	..	V m
Maj. H. G. Hubbell, Q.-M.	17	15	32	17	17	34	"	..	..	V m	1st c. m.
Capt. G. C. Bishop, A.-D.-C.	22	20	42	22	19	41	Sharps'r.	..	m	m	1st c. m.
Sergt. C. R. Burnham, Orderly	16	9	25	18	20	38	1st Cl. M.	..	..	..	m
Sergt. W. A. Pratt, Orderly	17	20	37	18	22	40	V Sharps'r.	s '86	s	s	s

FIRST REGIMENT.

FIELD, STAFF, NON-COMMISSIONED STAFF, AND HOSPITAL CORPS.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Colonel C. B. Erichson	18	9	27	19	21	40	Sharps'r.	m'78 m'79 m '80.			
Lt.-Col. A. L. Thompson	18	9	27	22	21	43	"	..	..	..	X s
Captain F. C. Wilson, Adj.	17	9	26	22	18	40	"	m '83			
1st Lieut. L. B. Norton, Q.-M.	19	7	26	19	21	40	"	m '84			
1st Lieut. W. C. Cheney, P.M.	18	8	26	21	21	42	"	..	..	m	m
Major T. F. Rockwell, Surg.	16	9	25	20	17	37	1st Cl. M.				
1st Lieut. F. H. Peltier. A. Sur.	18	7	25	20	21	41	V Sharps'r.	s '85 m '86	m	1st c. m.	
Capt. C. H. Faulkner, I. R. P.	19	6	25	20	22	42	Sharps'r.	m '78		..	
Chaplain H. H. Kelsey	15	14	29	20	23	43	"			..	
Sergt. Maj. T. A. Kimberly	21	4	25	21	21	42	"	..	X s	s	1st c. m.
Q.-M. Sgt. E. W. Bull	20	6	26	17	18	35	1st Cl. M.	m '84	..	m	
Chief Trump'r H. Scheuy	18	9	27	19	21	40	V Sharps'r.	m'79 m'83	m	m	
Private Howell, W. A.	13	13	26	15	13	28	Marksman.				
" Randall, F. A.	17	12	29	14	16	30	"				

COMPANY A.

Captain Edward Schulze	20	22	42	20	18	38	1st Cl. M.	..	..	X s	s
1st Lieut. Henry F. Smith	14	13	27	14	13	27	Marksman.	m'81 m'83 s '84			
2d Lieut. James C Bailey	16	13	29	18	20	38	1st Cl. M.	V m '86	..	m	
Q.-M. Sgt. W. C. Herter	20	16	36	15	13	28	Marksman.	..	m	m	s
1st Sgt. Wm. Blevins	21	19	40	17	16	33	V 1st Cl. M.	m '83 s '84	..	m	m
Sergeant W. H. Bihl	14	13	27	15	13	28	Marksman.				
Corporal C. F. Wolf	19	20	39	19	14	33	V Marks'n.	m '86	m	1st c. m.	m
" A. W. Roulston	18	13	31	16	13	29	Marksman.	m '85	..	m	m
" J. Ojinskie	19	12	31	16	17	33	"	..	..	..	m
" E. H. Siemer	15	11	26	13	14	27	"				
Musician E. E. Lamb	13	15	28	14	15	29	"				
" B. F. Prouty, Jr.	14	12	26	14	13	27	"				
Private Ganley, W. J	16	13	29	13	20	33	"				
" Gibbons, J	15	12	27	18	14	32	"				
" Hansen, C. A	20	10	30	15	13	28	"	..	..	m	
" Martin, J. F	15	12	27	16	13	29	"				
" Parker, W. E	13	15	28	15	13	28	"	..	m	m	m
" Reiche, P. R	13	13	26	14	15	29	"				

COMPANY B.

Captain J. F. Lawler	19	18	37	18	22	40	Sharps'r.	V m '85	..	m	
1st Lieut. R. J. Kingsley	22	20	42	23	21	44	"	V 1st c. m. '85	..	1st c. m.	

COMPANY C.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
1st Lieut.	F. H. Linker......	22	15	37	18	22	40	Sharps'r.				
Q.-M. Sgt.	H. M. Loomis.....	15	14	29	13	20	33	Marksman.				
Sergeant	F. E. Davis........	14	15	29	17	21	38	1st Cl. M.				
Private	Haun, C. F........	13	13	26	14	18	32	Marksman.				
"	Milne, J. D........	18	18	36	19	19	38	1st Cl. M.				
"	Mead, C. E........	14	13	27	15	18	33	Marksman.				
"	Ward, T...........	14	16	30	13	18	31	"				

COMPANY D.

Captain	W. E. Allen.......	25	24	49	20	25	45	Sharps'r.	V s '84 1st c. m. '86	1st c. m.	..	s
1st Lieut.	F. W. Humphrey..	13	14	27	16	17	33	V Marks'n.	m' 83, '84, '86	m		
2d Lieut.	S. M. Leonard.....	22	18	40	20	22	42	Sharps'r.	..	1st c. m.	..	s
Q.-M. Sgt.	H. E. Stearns......	21	23	44	17	16	33	1st Cl. M.		..	..	m
Sergeant	L. C. Young.......	23	15	38	17	17	34	"				
Corporal	F. W. Dimock....	15	17	32	16	17	33	Marksman.				
Musician	N. E. Atwood.....	17	13	30	14	16	30	"	m '84, 85			
Private	Allen, F. N........	18	16	34	19	22	41	Sharps'r.				
"	Allen, H. W.......	15	13	28	15	13	28	Marksman.				
"	Button, C. W......	14	16	30	17	14	31	"	m '79			
"	Hart, B. F.........	18	16	34	14	14	28	"				
"	Heineman, O. J....	13	14	27	14	16	30	"				
"	Lockwood, V......	13	14	27	13	14	27	"				
"	Schutz, E. F	13	14	27	13	14	27	"	..	..	..	1st c. m.

COMPANY E.

Captain	G. O. McLean.....	21	16	37	21	23	44	V Sharps'r.	m '78, '79, '80, s '83			
1st Lieut.	J. J. Smith........	13	16	29	18	17	35	1st Cl. M.	V m '84			
Sergeant	H. N. Saunders....	14	16	30	19	19	38	"	..	..	V m	m
Q.-M. Sgt.	H. F. Latham.....	16	13	29	18	16	34	"	V m '84	..	..	1st c. m.
Corporal	F. Bullen..........	13	13	26	17	19	36	V 1st Cl. M.	1st c.m. '86	1st c.m. '87	1st c. m.	m
Private	Billian, F..........	14	15	29	18	19	37	1st Cl. M.				
"	Footit, J. H.......	15	14	29	18	22	40	Sharps'r.				
"	Green, G. W........	15	19	34	18	16	34	1st Cl. M.	..	..	..	m
"	Sault, W. E........	16	9	25	18	24	42	Sharps'r.				
"	Slaney, O. H......	16	12	28	15	14	29	Marksman.				
"	Wheeler, H. A.....	13	13	26	14	16	30	"				
"	Wheeler, W. A....	15	12	27	14	15	29	"				
"	White, S. C.......	15	12	27	14	14	28	"				
"	Wooster, R. C.....	15	13	28	14	14	28	"				

COMPANY F.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	C. H. Wickham...	13	17	30	22	21	43	Sharps'r.	V s'83, s 84	..	1st c. m.	
1st Lieut.	L. B. Hubbard.....	14	16	30	19	21	40	"	V s'84, s 86	..	1st c. m.	m
2d Lieut.	L. N. Mansuy.....	19	11	30	21	21	42	"	m '81, '83 s '84			
Q.-M. Sgt.	L. M. Woodford...	15	11	26	19	21	40	V Sharps'r.	s '84, m'85	m	1st c. m.	
Sergeant	F. E. Hovey.......	20	20	40	19	21	40	Sharps'r.	..	V m	1st c. m.	1st c. m.
"	N. H. Stevens.....	17	9	26	20	22	42	"	..	..	V m	m
Corporal	H. S. Strong.......	16	13	29	21	19	40	V Sharps'r.	m '86	1st c. m.	1st c. m.	m
"	L. J. Alger........	18	12	30	15	14	29	Marksman.	m '85	1st c. m.	..	m
"	W. H. Bruce.......	18	11	29	20	19	39	1st Cl. M.	m '86			
"	F. C. Ives.........	17	23	40	17	23	40	Sharps'r.		..		
Musician	G. M. Smith.......	16	10	26	18	16	34	1st Cl. M.	m '84	..	m	
Private	Broadhurst, L. P..	15	10	25	15	19	34	Marksman.	..	..	..	m
"	Bill, D. H.........	21	21	42	18	19	37	1st Cl. M.	..	..	..	m
"	Bolles, E. F.......	19	19	38	19	19	38	"	..	..	V 1st c.m.	
"	Campbell, T H....	13	14	27	19	15	34	Marksman.	..	..	..	1st c. m.
"	Chamberlin, J. H..	17	9	26	19	22	41	Sharps'r.	..	..	..	m
"	Dennis, J. W......	17	21	38	17	17	34	1st Cl. M.	..	..	1st c. m.	1st c. m.
"	Griswold, W. B...	15	13	28	20	16	36	"	..	1st c. m.	m	1st c. m.
"	Hastings, F. E....	17	20	37	15	20	35	Marksman.	..	..	..	m
"	Johnson, R. B.....	16	12	28	17	14	31	"				
"	Johnson, W. F....	15	17	32	19	22	41	Sharps'r.				
"	Mather, W. T.....	16	13	29	17	18	35	1st Cl. M.				
"	Talcott, W. H.....	21	16	37	17	20	37	"	..	m	m	m
"	Washburn, E. J...	15	17	32	14	13	27	Marksman.				
"	Wheeler, J. A.....	14	16	30	17	19	36	1st Cl. M.				

COMPANY G.

Captain	John Hickey......	18	18	36	18	20	38	1st Cl. M.	m '84	..	..	s
1st Lieut.	C. L. Bissell.......	19	18	37	21	17	38	"	V 1st c. m. '86	1st c. m.	1st c. m.	s
Sergeant	P. Madden.........	20	20	40	20	16	36	"	V s '85	1st c. m.	1st c. m.	1st c. m.
Q.-M. Sgt.	A. C. House.......	21	15	36	19	17	36	"	..	1st c. m.	m	s
Sergeant	J. Marley..........	19	20	39	17	17	34	V 1st Cl. M.	m '83, '84, '86	..	m	
Corporal	W. B. Porter......	15	19	34	20	17	37	1st Cl. M.	m '81, '82	..	..	1st c. m.
"	W. J. Maxwell....	13	16	29	14	14	28	Marksman.	..	..	..	m
"	R. Russell.........	14	19	33	15	17	32	"	..	..	m	
"	P. Freher,.........	15	19	34	19	13	32	"				
Private	Crockett, T........	19	19	38	17	13	30	"				
"	Nilson, J..........	15	15	30	14	20	34	"	m '85			
"	Rice, Thomas.....	13	17	30	14	16	30	"				
"	Stebbins, G........	14	22	36	16	16	32	Marksman.				

COMPANY H.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	W. H. McLean....	13	20	33	20	23	43	Sharps'r.	..	X 1st c.m.	s	s
2d Lieut.	C. H. Patterson ...	19	20	39	22	23	45	X Sharps'r	Vs '84 s'85 1st c.m.'86	..	s	1st c. m.
Q.-M. Sgt.	T. R. King........	13	14	27	18	17	35	1st Cl. M.				
Sergeant	A. Collins.........	21	4	25	23	24	47	Sharps'r	..	..	..	V s
"	E. Cooper.........	18	8	26	20	22	42	Sharps'r	..	..	V m	m
"	A. C. Morse.......	13	14	27	22	20	42	"	..	..	m	1st c. m.
"	C. Milton..........	17	19	36	20	20	40	"	..	..	..	m
Corporal	C. E. Clark.........	16	11	27	20	20	40	"				
"	C. P. O'Neill......	17	9	26	20	20	40	"	..	..	..	m
"	G. L. Willey.......	17	18	35	19	22	41	"	..	..	m	m
Private	Cudworth, H. J ...	13	12	25	19	17	36	1st Cl. M.	..	..	..	m
"	Evans, W. H......	16	19	35	18	18	36	"				
"	Gaines, C. E.......	19	11	36	20	15	35	Marksman.				
"	Lapointe, J. N....	13	12	25	20	16	36	1st Cl. M.				
"	Mahoney, W. E....	17	18	35	19	21	40	Sharps'r.	..	..	..	m
"	Putnam, F. L......	13	13	26	17	17	34	1st Cl. M.				
"	Putnam, S. J......	23	21	44	19	21	40	Sharps'r.	..	..	..	1st c. m.
"	Sullivan, D. F.....	16	18	34	20	21	41	"				
"	Wright, F. O......	18	12	30	20	23	43	"				

COMPANY K.

1st Lieut.	C. H. Slocum......	21	6	27	20	20	40	Sharpsh'r.	V m '84 1st c.m.'86	..	1st c. m.	m
2d Lieut.	H. H. Saunders ...	22	4	26	20	22	42	X Sharps'r.	V m '83 s '84 1st c.m.'85	..	m	1st c. m.
Q.-M. Sgt.	N. H. Valentine ...	17	9	26	19	16	35	1st Cl. M.	..	m	m	
Sergt.	F. E. Johnson.....	15	10	25	18	16	34	"	s '83 m '84			
"	W. F. Buckingham	20	7	27	18	14	32	Marksman.				
Corporal	R. E. H. Birney ...	13	14	27	20	15	35	"	..	m		m
"	H. W. Scott.......	14	12	26	18	13	31	"	..			m
"	S. G. Huntington..	16	9	25	18	17	35	1st Cl. M.	..			m
"	A. M. Lane........	16	11	27	19	21	40	Sharpsh'r.	..			V m
"	L. Gundlach, Jr. ..	16	11	27	14	13	27	Marksman.				
"	E. C. Wander......	14	11	25	17	14	31	"	..	..	m	m
Musician	J. F. Sherman, Jr..	14	15	29	18	19	37	1st Cl M.				
Private	Burnham, H. M...	13	14	27	15	16	31	Marksman.				
"	Chase, R. L........	16	9	25	16	13	29	"				
"	Cooley, G. E., Jr. .	16	9	25	16	13	29	"				
"	Fenn, C. W........	13	12	25	17	16	33	1st Cl. M.				
"	Griswold, R. S., Jr.	17	12	29	19	21	40	Sharpsh'r.				
"	Holcomb, G. N....	15	13	28	20	17	37	1st Cl. M.	m'84 m'85	s		
"	James, H. K.......	14	11	25	18	14	32	Marksman.				
"	Morrell, J. W......	20	6	26	16	17	33	"	..	..	..	m
"	Morrell, D. S......	14	14	28	16	13	29	"	..	..	..	m
"	Small, F. F........	15	11	26	19	13	32	"	..	..	m	
"	Smith, W. B., Jr...	14	11	25	18	13	31	"				
"	Way, L. M	18	7	25	17	18	35	1st Cl. M.				
"	Whiton, R. P......	19	6	25	14	13	27	Marksman.				

FIRST SIGNAL CORPS.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
1st Lieut.	Morris Penrose....	20	7	27	22	20	42	Sharpsh'r.	..	V s	s	s
Sergt.	H. A. Giddings....	21	6	27	21	19	40	"	..	1st c. m.	m	
Corporal	F. G. Blakeslee....	16	13	29	21	19	40	"				
"	A. B. Jenkins	15	10	25	20	21	41	"	..	..	..	m
Private	Carter, C. P.........	22	4	26	21	23	44	"	..	..	..	m
"	Bramley, W. G....	16	11	27	17	13	30	Marksman.				
"	Edwards, A. B.....	13	18	31	19	20	39	1st Cl. M.				
"	Perine, F. G........	20	7	27	18	17	35	"				
"	Roberts, H. C......	18	7	25	19	22	41	Sharpsh'r.				
"	Shaffer, C. O.......	16	10	26	15	13	28	Marksman.				

FIRST MACHINE-GUN PLATOON.

Private	Marsh, W. R......	19	14	33	15	19	34	Marksman.	..	..	m	m
"	Nish, W...........	17	15	32	14	15	29	"				

SECOND REGIMENT.

FIELD, STAFF, AND NON-COMMISSIONED STAFF.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Colonel J. B. Doherty	18	16	34	18	19	37	1st Cl. M.	..	..	..	V s
Capt. A. M. Dickinson, Adj..	19	15	34	17	18	35	"	..	..	..	m
Major J. M. Benedict, Surg...	17	13	30	20	19	39	"	..	..	m	m
Captain C. C. Ford, I. R. P...	21	20	41	19	22	41	V Sharps'r.	1st c.m.'85 Sharp.'86	s	..	s
1st Lt. W. G. Daggett, A. Surg	16	14	30	17	16	33	1st Cl. M.	..	..	..	1st c. m.
Com.-Sergt. H. P. Vibert, Jr.	17	15	32	18	17	35	"	..	..	..	X s
Hosp'l St'w'd W. N. Barber..	23	17	40	20	20	40	Sharps'r.	..	..	V s	s
Chf. Trump'r M. W. Meaney.	21	19	40	20	21	41	"				

COMPANY A.

Captain C. L. Stocking	21	15	36	17	14	31	Marksman.	..	m	m	m
1st Lieut. W. E. Moses.......	24	18	42	17	15	32	"	..	s	s	m
2d Lieut. C. W. Burpee......	16	20	36	15	21	36	"	..	..	m	
1st Sergt. H. B. Carter	15	17	32	18	23	41	Sharps'r.	..	..	V s	1st c. m.
Q.-M. Sgt. E. J. Schuyler	21	18	39	17	14	31	Marksman.	..	..	..	V m
Sergeant W. H. Claxton. ...	14	15	29	17	17	34	V 1st Cl. M.	m'82 m'86	..	m	1st c. m.
" J. W. Fitzpatrick..	21	19	40	18	23	41	V Sharps'r.	1st c m.'86	1st c. m.	1st c. m.	s
" W. A. Goldsmith..	20	15	35	20	18	38	1st Cl. M.	..	..	..	V s
" W. L. Monson	19	15	34	13	17	30	Marksman.	..	..	..	V 1st c. m.
Corporal E. Hart	15	20	35	19	21	40	V Sharps'r.	m '86	m	m	m
" H. C. Cady	18	15	33	18	13	31	Marksman.	..	..	m	
" E. O. Goss.........	16	16	32	16	20	36	"				
" J. S. Whiteman....	17	19	36	22	21	43	V Sharps'r.	1st c.m.'86	1st c. m.	1st c. m.	1st c. m.
Musician C. A. Lathrop	13	14	27	15	13	28	V Marks'n.	m '85	1st c. m.	m	m
" W. G. Christian....	18	7	35	14	14	28	Marksman.				
Private Boden. F. C.	18	13	31	15	14	29	"	..	..	..	m
" Bigelow, W. A.....	23	13	36	19	22	41	Sharps'r.	..	m	m	m
" Bailey, R. E.......	18	17	35	16	15	31	Marksman.	..	m	1st c. m.	1st c. m.
" Brown, G. W......	13	18	31	13	13	26	"	..	m	m	1st c. m.
" Carter, E. L	17	15	32	17	19	36	1st Cl. M.				
" Daniels, F. B......	21	16	37	19	16	35	"	..	..	..	m
" Goss, J. H.........	16	16	32	16	19	35	Marksman.				
" Herman, C. F.	14	13	27	14	13	27	"				
" Humphrey, C. H...	16	17	33	18	17	35	1st Cl. M.				
" Ingraham, F. W...	14	20	34	15	7	32	Marksman.				
" Miller, D..........	17	16	33	16	15	31	"				
" McNeil, W. H. J...	15	15	30	20	14	34	"	..	..	m	
" Petitjean, G. E ...	18	19	37	17	14	31	"	..	..	1st c. m.	m
" Ross, C. H........	21	22	43	17	19	36	1st Cl. M.				
" Scovill, H. S.......	13	13	26	18	16	34	"				
" Trott, A. N.........	14	15	29	18	15	33	Marksman.	..	..	m	m
" Walker, R.........	18	18	36	15	20	35	"	..	..	m	m
" Walker, J. R	14	13	27	13	16	29	"				
" Ward, J. W........	18	21	39	22	20	42	V Sharps'r.	s '85 m '86	m	1st c. m.	

COMPANY B.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	John Gutt	14	13	27	17	14	31	V Marks'n.	1st c.m.'86	s	1st c. m.	1st c. m.
1st Lieut.	C. G. Miller	19	15	34	15	13	28	Marksman.	..	..	..	1st c. m.
2d Lieut.	L. Kling	13	15	28	15	13	28	"				
Q.-M. Sgt.	A. H. Molen	20	16	36	18	17	35	1st Cl. M.	m '86	m	..	m
Sergeant	J. L. Scheen	17	17	34	21	14	35	Marksman.	..	m	..	1st c. m.
"	H. A. Kapitzke	15	18	33	16	19	35	"	..	..	..	m
"	A. F. Landensack	20	21	41	21	21	42	Sharps'r.	..	s	..	s
Corporal	L. R. Richter	15	14	29	13	15	28	Marksman.	..	..	..	m
"	W. W. Gadd	15	17	32	19	21	40	V Sharps'r.	m '86.	m	s	1st c. m.
Private	Peterson, E. L.	13	15	28	16	15	31	Marksman.	..	..	..	m
"	Pokrop, R.	15	13	28	13	14	27	"				
"	Schreck, G.	13	17	30	17	15	32	"				

COMPANY C.

Captain	M. Creed	21	22	43	22	21	43	Sharps'r.	V 1st Cl. M. '86	..	s	s
1st Lieut.	J. J. Kennedy	19	18	37	21	21	42	"	..	..	V 1st c.m.	s
2d Lieut.	J. F. Plunkett	19	20	39	22	21	43	V Sharps'r.	m '85, s '86	..	1st c. m.	s
Sergeant	F. Darcey	18	17	35	18	20	38	1st Cl. M.				
"	J. M. Kehoe	17	17	34	20	16	36	"	..	..	..	1st c. m.
Corporal	J. E. Killoy	14	14	28	19	17	36	"	..	..		
"	J. J. Shanley	14	14	28	15	21	36	Marksman.	..	..	..	m
"	W. P. Gilligan	16	16	32	18	20	38	1st Cl. M.	..	..	m	1st c. m.
Private	Cassidy, E. P	16	15	31	19	20	39	"	..	..	..	m
"	Flanagan, W. F.	16	15	31	15	19	34	Marksman.				
"	Guinan, J. R.	15	14	29	19	17	36	1st Cl. M.	..	..	..	m
"	Lynch, M. J	13	14	27	17	20	37	"	..	..	..	m
"	Palmer, J. H. Jr.	17	16	33	18	18	36	"	..	..	..	1st c. m.
"	Regan, W. A.	18	18	36	2	21	41	Sharps'r.				

COMPANY D.

1st Sergt.	W. G. Doherty	15	22	37	15	19	34	V Marks'n.	m '86	1st c. m.	s	s
Sergeant	F. R. Fairbanks	16	22	38	21	19	40	V Sharps'r.	m '86	1st c. m.	1st c. m.	s
"	H. E. Booth.	20	21	41	15	16	31	Marksman.	..	1st c. m.	1st c. m.	s
Corporal	W. R. Taylor	18	20	38	21	19	40	Sharps'r.	..	m	..	s
Private	Linsley, F. A.	13	13	26	16	15	31	Marksman.				
"	Morse, H. F	20	17	37	15	15	30	"				
"	Morrison, J. H.	13	14	27	14	22	36	"				
"	Payne, M. T.	15	20	35	20	21	41	Sharps'r.				
"	Robinson, W. J.	18	19	37	20	19	39	1st Cl. M.				
"	Shepard, W. H	21	17	38	20	20	40	Sharps'r.				
"	Smith, A. B.	17	16	33	16	18	34	Marksman.	..	..	..	m

COMPANY E.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
1st Lieut.	F. L. Lehr	14	17	31	14	13	27	Marksman.	..	..	m	
Sergeant	C. S. Schappa	18	20	38	21	19	40	Sharps'r.	..	..	..	V 1st c.m.
Corporal	J. W. Landon	20	24	44	21	23	44	"	..	..	..	V s
"	C. F. Smith	18	17	35	19	23	42	V Sharps'r.	m'85, m'86	..	1st c. m.	s
Musician	J. H. Parker	20	21	41	19	19	38	1st Cl. M.	..	..	V s	1st c. m.
Private	James, J. E.	19	17	36	18	17	35	"	..	m	m	m
"	Reed, F. W.	23	19	42	21	19	40	Sharps'r.	..	..	..	m
"	Rogers, C. W.	14	13	27	13	15	28	Marksman.	..	1st c. m.	m	1st c. m.
"	Russell, W. N.	16	14	30	17	20	37	1st Cl. M.				
"	Spencer, W. E.	22	22	44	21	22	43	Sharps'r.	..	..	..	m
"	Williams, C. H.	15	15	30	14	13	27	Marksman.	..	..	..	m

COMPANY F.

Captain	B. E. Brown	20	17	37	19	21	40	Sharps'r.	..	..	..	m
Q.-M. Sgt.	W. H. Blakeslee	19	18	37	18	23	41	Sharps'r.	V s '85, s '86	s	..	s
Sergeant	C. F. McCabe	20	15	35	17	18	35	V 1st Cl. M.	m '86	m	1st c. m.	m
"	C. Smith	18	20	38	18	16	34	1st Cl. M.	..	..	..	V m
"	C. D. Nicholl	14	16	30	15	20	35	Marksman.	1st c. m. '86	..	1st c. m.	m
"	C. B. Dann	22	19	41	21	19	40	Sharps'r.	..	m	s	1st c. m.
Corporal	S. F. Penderson	16	20	36	17	20	37	V 1st Cl. M.	m '86	1st c. m.	1st c. m.	m
"	J. B. Cunningham	15	16	31	17	20	37	1st Cl. M.	..	..	..	m
"	J. McCann	17	18	35	18	20	38	"	..	m	1st c. m.	m
"	E. O. Gruener	14	13	27	19	14	33	Marksman.	..	1st c. m.	1st c. m.	
"	J. H. Cannon	13	17	30	16	19	35	"	..	1st c. m.		
Musician	J. N. Champion	20	16	36	21	20	41	Sharps'r.	..	V s	s	s
"	C. L. Gaylord	14	15	29	17	15	32	Marksman.	..	..	..	m
Private	Barnes, A. L.	13	15	28	17	16	33	1st Cl. M.	..	m	m	m
"	Butler, G. H	14	19	33	17	16	33	"	..	..	..	m
"	Clark, R.	19	15	34	19	17	36	"				
"	Coburn, C. O.	16	13	29	15	19	34	Marksman.	..	..	..	m
"	Crampton, W. I.	13	18	31	17	19	36	1st Cl. M.	..	..	..	1st c. m.
"	Gorham, F. R.	21	16	37	19	18	37	V 1st Cl. M.	s '86	s	s	m
"	Griffing, J. H	20	19	39	14	13	27	Marksman.	..	..	..	m
"	Hammond, L. R.	19	14	33	20	18	38	1st Cl. M.	..	s	1st c. m.	m
"	Isbell, E. L.	14	14	28	17	21	38	"	..	..	..	1st c. m.
"	Lowe, J. W.	13	15	28	16	16	32	Marksman.				
"	Loveridge, S. B.	17	16	33	17	15	32	"	..	..	..	1st c. m.
"	Ruff, J. R.	19	15	34	13	18	31	"	..	..	..	m
"	Schwagerman, W. H.	18	15	33	16	13	29	"				
"	Smith, J. H.	14	13	27	17	17	34	V 1st Cl. M.	m '86	m	1st c. m.	1st c. m.
"	Thorpe, A. N.	15	16	31	17	14	31	Marksman.	..	..	..	m

COMPANY G.

	Names.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	A. J. Wolff........	21	18	39	20	21	41	V Sharps'r.	m '82	1st c. m.	1st c. m.	1st c. m.
1st Lieut.	D. E. Fitzpatrick..	15	17	32	18	18	36	1st Cl. M.	..	1st c. m.	1st c. m.	m
2d Lieut.	P. Halpin	14	14	28	19	16	35	"	..	..	m	
1st Sergt.	W. T. Keavney	17	22	39	17	17	34	"	..	..	..	m
Sergeant	T. F. Hallinan.....	18	14	32	19	16	35	"	..	..		
"	B. Collins.........	17	18	35	16	14	30	Marksman.	..	..	1st c. m.	m
Corporal	P. H. Danaher.....	20	17	37	19	13	32	"				
"	E. L. Maloney.....	14	13	27	13	13	26	"	..	..	m	
"	J. Massey	14	15	29	15	18	33	"	..	..	..	m
Musician	C. Nolan	17	14	31	18	14	32	"	..	m	m	m
"	J. F. Flaherty.....	13	14	27	13	17	30	"	..	..	m	m
Private	Carroll, W. H.	14	19	33	18	16	34	1st Cl. M.				
"	Casey, D. M.......	15	16	31	17	14	31	Marksman.				
"	Dillan, J..........	14	13	27	16	13	29	"				
"	Garde, J. W.......	14	15	29	13	13	26	"				
"	Hudner, F. J......	16	13	29	17	16	33	1st Cl. M.	..	..	m	m
"	Hanlon, J. F......	15	15	30	17	20	37	"				
"	Lawlor, T. F......	19	19	38	14	16	30	Marksman.	..	..		m
"	Lynehan, W. H....	13	14	27	14	15	29	"				
"	Miller, M. H	20	20	40	15	16	31	"				
"	Overton, C. B.....	16	14	30	19	13	32	"	..	..	1st c. m.	m
"	Shannahan, E. J..	18	13	31	14	15	29	"	..	m	m	

COMPANY H.

Captain	W. U. Pearne	22	17	39	18	18	36	1st Cl. M.	..	X s	s	1st c. m.
2d Lieut.	J. T. Elliott	22	17	39	20	21	41	X Sharps'r.	V m '84 1st c.m. '85	1st c. m.	1st c. m.	1st c. m.
1st Sergt.	W. R. Markham ..	15	14	29	19	20	39	1st Cl. M.	m '86	1st c. m.		
Q.-M. Sgt.	N. H. Smith	18	8	26	15	17	32	V Marks'n.	m'84 m'86	m	m	
Sergeant	G. H. Kavanaugh .	20	5	25	17	16	33	1st Cl. M.	..	..	V m	m
"	P. Cantwell	14	13	27	15	15	30	Marksman.				
Corporal	E. M. Addis	18	9	27	21	20	41	Sharps'r.	..	..	..	V 1st c.m.
"	O. H. Wells	16	17	33	17	15	32	Marksman.				
"	J. W. Barry.......	16	13	29	13	14	27	"	..	..	..	m
"	J. A. Broatch	16	10	26	18	17	35	1st Cl. M.				
Musician	C. W. Van Pelt,...	13	13	26	17	13	30	Marksman.	m '86			
Private	Bailey, J. C.	15	14	29	18	16	34	1st Cl. M.				
"	Babcock, W. E....	13	17	30	16	14	30	Marksman.				
"	Calef, S. P.........	14	13	27	16	19	35	"				
"	Hull, C. H	13	20	33	16	13	29	"				
"	Hedges, E. C......	13	15	28	17	13	30	"				
"	Hubbard, H. B....	14	14	28	20	16	36	1st Cl. M.				
"	Hubbard, R.	13	13	26	13	13	26	Marksman.				
"	Hubbard, F. E....	15	15	30	18	13	31	"				
"	Sherman, E. A....	20	13	33	16	16	32	"				
"	Smith, H. H.......	15	13	28	13	14	27	"				

COMPANY I.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	C. B. Bowen........	22	21	43	20	20	40	Sharps'r.	..	..	..	V s
1st Lieut.	C. R. Darnstaedt ..	21	19	40	20	21	41	"	V m '85	..	1st c. m.	s
2d Lieut.	O. L. Bradley......	20	18	38	20	20	40	"	m '80	..	1st c. m.	s
1st Sergt.	J. W. Deno	22	23	45	21	20	41	"	m '84	..	m	s
Q.-M. Sgt.	J. C. Booth	22	22	44	20	20	40	"	s '84 V m '82	..	1st c. m.	m
Sergeant	P. T. Vibert.......	16	17	33	15	14	29	Marksman.	..	..	m	m
"	E. L. Brown	16	19	35	18	13	31	"	..	..	m	m
"	S. Weinpenny......	16	20	36	13	13	26	"	..	..	..	m
"	J. T. Walker.......	14	14	28	13	13	26	"	..	..	m	m
Corporal	H. F. Johnson......	16	17	33	16	17	33	"	..	..	m	m
"	W. E. Lewis	20	21	41	14	14	28	"	..	..	1st c. m.	m
"	W. H. Rees	17	16	33	14	15	29	"	..	..	m	m
"	T. J. Bolger........	20	20	40	20	21	41	Sharps'r.	..	..	..	V s
"	D. R. Jones........	22	19	41	14	20	34	Marksman.	..	..	m	1st c. m.
"	W. L. Moses	18	20	38	16	15	31	"	..	..	m	m
"	O. W. Bemont	13	19	32	15	13	28	"	..	..	..	m
"	G. E. Withey, Jr...	20	19	39	20	21	41	Sharps'r.	..	..	..	V 1st c. m.
Musician	J. E. Bowen........	22	22	44	20	20	40	"	..	..	..	1st c. m.
"	J. E. Bulluss.......	15	1	31	13	16	29	Marksman.				
"	F. J. Fitzpatrick..	18	20	38	16	15	31	"	..	..	..	1st c. m.
Private	Angevine, H. B....	18	17	35	13	16	29	"	..	..	..	m
"	Bartholomew, J. A	19	22	41	13	13	26	"	..	..	m	m
"	Beal, J. J	20	20	40	20	20	40	Sharps'r.	..	..	m	1st c. m
"	Breckenridge, A. G	13	15	28	16	18	34	Marksman.	..	..	..	s
"	Boyle, J., Jr..	15	17	32	13	13	26	"	..	..	..	m
"	Barr, W. W........	17	14	31	14	13	27	"	..	..	..	m
"	Banks, J. W	18	18	36	17	13	30	"				
"	Bloxham, H. W...	13	19	32	15	17	32	"				
"	Batterson, G. S ...	17	18	35	13	16	29	"				
"	Connolly, J	13	16	29	16	14	30	"				
"	Cook, W. B........	13	16	29	13	20	33	"	..	..	..	m
"	Cumming, J.......	20	23	43	20	20	40	Sharps'r.	..	..	..	m
"	Clark, J. R........	13	19	32	13	13	26	Marksman.	..	..	..	m
"	Demline, W. J	13	14	27	16	14	30	"	..	..	..	m
"	Darnstaedt, H. J ..	18	19	37	17	17	34	1st Cl. M.	..	..	..	1st c. m.
"	Ford, D. E.........	22	20	42	14	15	29	Marksman.	..	..	..	m
"	Frederick, O. G....	18	18	36	14	13	27	"	..	..	..	m
"	Hagner, G. A.....	17	14	31	13	13	26	"	..	..	..	1st c. m.
"	Hobson, S....	17	16	33	16	17	33	"	..	..	m	m
"	Hackbarth, J. L ..	14	15	29	14	15	29	"	..	..	..	m
"	King, H. T.........	14	13	27	14	14	28	"	..	..	..	m
"	Martindale, A. S..	22	17	39	13	14	27	"	..	..	..	m
"	Martin, C., Jr.....	13	15	28	17	15	32	"	..	..	..	m
"	MacIntyre, D......	21	18	39	13	13	26	"	..	..	..	m
"	Mason, W. F......	20	13	33	14	15	29	"				
"	Morenz, J. F......	18	22	40	15	13	28	"				
"	Mathews, R. J....	16	16	32	18	17	35	1st Cl. M.				
"	Mansfield, E. A..	17	17	34	15	17	32	Marksman.				
"	Patterson, W. E...	19	19	38	14	13	27	"				
"	Phillips, F. E.....	18	19	37	19	17	36	1st Cl. M.				
"	Proudman. G. E...	18	17	35	14	14	28	Marksman.				
"	Peer, L B.........	14	21	35	14	16	30	"				
"	Reynolds, W. W...	20	17	37	16	13	29	"	..	..	..	m
"	Reynolds, G.-A....	19	23	42	16	15	31	"				
"	Ross, E. J.........	19	21	40	13	13	26	"				
"	Rice, W. B........	13	16	29	13	15	28	"				
"	Schleiter, W. E....	16	24	40	13	16	29	"	..	..	..	m
"	Sutterlin, L. H....	17	18	35	19	15	34	"	..	..	..	m
"	Stait, J. H........	13	16	29	17	15	32	"	..	..	..	m
"	Sembler, H. F.....	17	19	36	14	13	27	"				
"	Tucker, A. J......	13	18	31	17	16	33	1st Cl. M.				
"	Tonge, A..........	22	18	40	15	19	34	Marksman.				
"	Wilkinson, C. R ..	18	22	40	17	14	31	"	..	..	m	m
"	Woodworth, S. B .	21	16	37	15	19	34	"	..	..	..	m
"	Wollschlager, V. I., Jr	21	19	40	13	14	27	"				
"	Zilke, J. F........	19	16	35	15	13	28	"				

COMPANY K.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	G. G. LaBarnes....	23	22	45	21	22	43	Sharps'r.	..	X s	s	s
1st Lieut.	R. E. Hall	21	22	43	18	16	34	1st Cl. M.	..	..	..	V 1st c. m.
2d Lieut.	H. Norton, Jr.	22	21	43	19	16	35	V 1st Cl. M.	1stc.m.'86	m	s	s
Sergeant	Z. P. Beach	21	21	42	17	23	40	Sharps'r.	..	X s	s	s
Corporal	A. W. Bevan	18	19	37	21	19	40	"	..	..	m	1st c. m.
"	C. C. Treat........	16	16	32	17	22	39	1st Cl. M.	..	..	m	
"	J. W. Newton.....	20	20	40	19	18	37	"	..	..	..	m
"	C. E. Zetlerholm ..	13	15	28	16	13	29	Marksman.				
"	F. E. Blake	13	14	27	16	16	32	"				
Private	Briggs, D	14	14	28	14	15	29	"	.			
"	Downey, J. A......	15	14	29	18	15	33	"				
"	Latham, J.........	17	14	31	14	16	30	"				
"	McCune, D. D.....	17	19	36	19	16	35	1st Cl. M.	1st c. m.	..	1st c. m.	1st c. m.
"	Mottram, T	22	22	44	20	23	43	V Sharps'r.	m '86	m	1st c. m.	1st c. m.

SECOND SIGNAL CORPS.

1st Lieut.	F. J. Duffy........	18	15	33	20	21	41	Sharps'r.	..	V s	s	
Sergeant	T. F. McKiernan..	14	13	27	18	22	40	"	m '85 1stc.M.'86			
Corporal	J. T. Sutcliffe......	14	13	27	17	19	36	1st Cl. M.	m '86			

THIRD REGIMENT.

FIELD, STAFF, NON-COMMISSIONED STAFF, AND HOSPITAL CORPS.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	200 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Colonel George Havens......	19	21	40	22	20	42	Sharps'r.	..	..	V s	s
Major W F. Bidwell.........	15	16	31	17	18	35	1st Cl. M.	..	V 1st c. m.	1st c. m.	1st c. m.
Major L. B. Almy, Surg.....	14	14	28	17	17	34	"	m '86	..	m	
Captain H. B. Smith, Adjt...	20	20	40	22	20	42	V Sharps'r.	m '85	1st c. m.	m	s
Captain T. H. Allen, I. R. P.	21	23	44	22	21	43	Sharps'r.	..	..	V s	s
1st Lt. J. La Pierre, Asst.Surg.	15	14	29	16	19	35	Marksman.				
Sergt-Maj. D. Connor........	22	21	43	20	23	43	Sharps'r.	..	.	..	V s
Com.-Sergt. P. H. Morgan ..	18	22	40	19	19	38	1st Cl. M.	..	..	m	1st c m.
Sergeant F. D. Sevin.........	18	14	32	14	17	31	Marksman.				
Private Eaton, C. S...........	14	13	27	15	15	30	"				
" Fields, J. J..........	15	13	28	13	15	28	"				

COMPANY A.

2d Lieut. H. S. Dorsey......	18	20	38	17	20	37	1st Cl. M.	..	..	..	m
Sergeant D. P. Hoare.......	13	15	28	17	18	35	"				
" J. P. Newman.....	16	13	29	18	18	36	"				
Private Farrell, W. H.....	17	20	37	19	21	40	Sharps'r.				

COMPANY B.

Captain Daniel Keleher....	17	21	38	20	21	41	Sharps'r.	..	V 1st c. m.	1st c. m.	s
1st Lieut. C. Bransfield......	18	19	37	20	24	44	"	V m '86.	1st c. m.	..	1st c. m.
2d Lieut. W. Fitzgerald.....	17	14	31	20	23	43	"	m '86	m	..	1st c. m.
1st Sergt. J. M. Bennett.....	14	14	28	14	14	28	Marksman.	..	1st c. m.		
Q.-M.Sgt. R. J. Rooney......	15	14	29	18	16	34	1st Cl. M.	..	..	..	m
Corporal J. H. Dougherty...	13	17	30	18	17	35	"				
" M. W. Flynn......	19	13	32	14	13	27	Marksman.	..	..	..	m
" J. F. Murphy......	13	13	26	17	13	30	"	..	..	..	m
" M. F. O'Connell...	14	19	33	20	22	42	Sharps'r.	..	..	..	m
Trumpt'r J. Conroy..........	13	14	27	13	17	30	Marksman.	..	..	..	m
Private Barber, W. E......	15	13	28	14	15	29	"				
" Donahue, T. J.....	15	13	28	18	19	37	1st Cl. M.	..	..	..	m
" Fisher, W. T......	15	14	29	13	14	27	Marksman.				
" Morrison, A. C....	19	14	33	18	13	31	"	..	..	..	m
" O'Keefe, W.......	17	15	32	16	14	30	"	..	..	..	m
" Sullivan, J. P.....	16	16	32	14	13	27	"				
" Sullivan, M. J.....	15	17	32	13	13	26	"				

COMPANY C.

Names.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain F. A. Fox	17	10	27	14	15	29	Marksman.	..	m	m	
1st Lieut. A. S. Howard	19	10	29	13	14	27	"	1st c.m. '85 m '86			
Sergeant H. B. Hatton	20	21	41	17	19	36	1st Cl. M.	V m '86	m	1st c. m.	1st c. m.
" C. S. Bennett	19	13	32	14	18	32	Marksman.	..	..	m	m
Corporal W. G. Hazelden	14	19	33	18	18	36	1st Cl. M.	..	..	..	V m
Private Church, C. W	13	16	29	16	14	30	Marksman.				
" Hagberg, J. A.	19	22	41	17	15	32	"	..	..	..	m
" Hagberg, C. A.	19	19	38	18	14	32	"	..	..	..	m
" McClimon, W. A.	23	20	43	13	20	33	"				
" Perkins, C. L.	16	10	26	17	18	35	1st Cl. M.	..	..	m	m
" Swahn, J. M.	20	16	36	16	18	34	Marksman.				

COMPANY D.

Captain F. E. St. Clare	16	12	28	18	17	35	1st Cl. M.	..	..	V m	
2d Lieut. M. W. Dart	14	14	28	17	16	33	"				
1st Sergt. J. Elliott, Jr.	13	14	27	17	17	34	"				
Sergeant L. A. Whaley	13	15	28	17	19	36	"	..	..	V 1st c. m.	1st c. m.
" W. J. Cullen	14	13	27	14	16	30	Marksman.	..	..	..	m
" W. R. Beach	16	18	34	18	18	36	1st Cl. M.	..	..	1st c. m.	1st c. m.
Corporal W. S. Whittlesey	15	16	31	19	19	38	"	..	m	..	m
" E. L. Crowell	20	17	37	19	22	41	Sharps'r.	V s '86	s	s	s
" A. M. Webb	15	19	34	18	15	33	Marksman.	..	..	..	1st c. m.
" F. W. Rogers, Jr.	18	18	36	18	15	33	"	..	..	..	m
Private Burdick, R. B.	14	18	32	17	18	35	1st Cl. M.	..	..	..	1st c. m.
" Cullen, R. T.	15	17	32	14	17	31	Marksman.	..	m	..	1st c. m.
" Feeley, P. F.	14	13	27	17	14	31	"				

COMPANY E.

Captain J. H. Morrison	17	15	32	19	17	36	1st Cl. M.	m '85	m	..	1st c. m.
1st Lieut. M. Heffernan	15	18	33	21	17	38	"	m '86			
2d Lieut. J. T. Lynch	14	18	32	19	18	37	"	..	..	..	1st c. m.
1st Sergt. J. Cockrane	19	20	39	20	21	41	Sharps'r.	..	m	1st c. m.	1st c. m.
Sergeant J. Savage	14	16	30	18	19	37	1st Cl. M.				
Corporal J. Connors	14	13	27	17	17	34	"	..	..	m	m
Musician J. Sheridan	13	14	27	17	17	34	"	..	..	..	1st c. m.
Private Bennett, W. C	16	14	30	17	20	37	"	..	..	..	1st c. m.
" Connor, D.	16	14	30	17	13	30	Marksman.				
" Golden, W.	15	17	32	15	17	32	"				
" Shea, C	13	13	26	15	13	28	"				
" Sherman, J. C.	14	14	28	15	13	28	"				
" Taylor, E. J.	14	18	32	17	18	35	1st Cl. M.				

COMPANY F.

Captain J. Armstrong	19	11	30	19	17	36	1st Cl. M.	..	m	m	1st c. m.
1st Lieut. K. A. Darbie.	17	11	28	16	15	31	Marksman.	..	..	m	m
2d Lieut. H. E. Burton	19	15	34	19	16	35	1st Cl. M.	..	m	1st c. m.	1st c. m.
Q.-M. Sgt. J. McManus	16	18	34	18	16	34	"	..	..	..	m
Sergeant H. W. Burton	17	12	29	14	14	28	Marksman.	..	..	m	1st c. m.
" M. Card	17	14	31	18	18	36	1st Cl. M.	..	1st c. m.	m	1st c. m.
Corporal J. Sullivan	20	14	34	19	19	38	"	..	..	..	1st c. m.
Private Kiley, E. T.	17	19	36	19	16	35	"	..	..	..	m
" Kieley, P.	19	17	36	17	17	34	"	..	..	..	1st c. m.
" Meguire, J. F.	21	16	37	13	19	32	Marksman.	..	..	..	1st c. m.

COMPANY G.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	E. G. Wright......	13	13	26	16	14	30	V Marks'n.	1st c.m.'85	m	1st c. m.	1st c. m.
1st Lieut.	H. J. Thayer	22	19	41	18	20	38	1st Cl. M.	..	..	..	V 1st c. m.
2d Lieut.	D. Flagg..........	20	20	40	16	13	29	Marksman.	..	..	..	V 1st c. m.
Sergeant	W. P. White.......	23	18	41	21	19	40	Sharps'r.	..	..	..	V s
"	M. Kilbourn	19	15	34	18	19	37	1st Cl. M.	..	..	m	1st c. m.
Corporal	C. E. Richmond...	14	13	27	17	21	38	"	..	..	..	m
"	A. P. Peterson	16	14	30	18	14	32	Marksman.				
"	A. D. McIntyre....	23	20	43	19	19	38	1st Cl. M.	..	1st c. m.	1st c. m.	s
"	B. K. Smith	16	20	36	19	15	34	Marksman.				
"	C. E. Wilcox......	14	16	30	21	19	40	Sharps'r.	..	m		
Private	Badmington, R. J..	18	17	35	19	19	38	1st Cl. M.				
"	Cole, A. R.........	18	17	35	17	21	38	"	..	..	..	V m
"	Withey, A. W.....	20	21	41	21	20	41	V Sharps'r.	m '85	s	1st c. m.	1st c. m.

COMPANY I.

Captain	Geo. M. Cole	19	21	40	19	22	41	Sharps'r.	..	..	..	V s
1st Lieut.	G. W. Metcalf.....	21	18	39	20	21	41	"	V s '86	s	s	s
2d Lieut.	S. Prince..........	20	17	37	20	20	40	V Sharps'r.	m '84 1st c.m.'85	s	..	1st c. m.
1st Sergt.	C. A. Miner	25	22	47	22	23	45	Sharps'r.	..	..	V s	s
Q.-M. Sgt.	J. A. Malona......	21	23	44	21	22	43	"	..	V s	s	s
Sergeant	W. H. Crowell.....	16	15	31	19	21	40	"	..	..	..	V 1st c. m.
"	F. J. Whitman.....	22	19	41	18	18	36	1st Cl. M.	..	..	..	V s
"	C. H. Brown.	15	19	34	23	17	40	Sharps'r.				
"	E. Monroe.........	16	10	26	18	17	35	1st Cl. M.	..	1st c. m.	1st c. m.	1st c. m.
Corporal	G. F. Benham.....	14	14	28	15	14	29	Marksman.	..	..	..	1st c. m.
"	R. N. Tinker......	15	24	39	20	20	40	Sharps'r.	..	m	m	1st c. m.
"	W. B. Camp.......	18	14	32	16	14	30	Marksman.				
"	F. S. Powers......	14	15	29	14	13	27	"				
"	J. Rockholz	16	10	26	19	21	40	Sharps'r.	..	..	..	1st c. m.
"	J. T. Sherwin......	17	18	35	20	21	41	"	..	..	..	s
Private	Cann, W., Jr......	17	19	36	19	16	35	1st Cl. M.				
"	Daniels, Geo. L ...	16	16	32	13	13	26	Marksman.				
"	Darrow, G. E.	18	13	31	16	13	29	"	..	..	..	m
"	Dunbar, R. W.	15	17	32	16	14	30	"				
"	Egan. L. J........	18	14	32	16	14	30	"	..	..	..	1st c. m.
"	Elliot, F. E........	16	14	30	15	14	29	"				
"	Fox, G. J.	21	20	41	21	21	42	Sharps'r.	..	..	..	1st c. m.
"	James, R. B.......	17	16	33	18	13	31	Marksman.	..	..	..	m
"	Jaeger, R. H......	17	16	33	18	13	31	"				
"	Newbery, H.......	15	15	30	16	15	31	"				
"	Pincus, E. H......	17	13	30	18	18	36	1st Cl. M.				
"	Phillips, J.........	20	19	39	16	18	34	Marksman.	..	..	m	s
"	Phillips, L........	19	16	35	21	20	41	Sharps'r.	..	1st c. m.	s	s
"	Rogers, A. D......	15	17	32	19	14	33	Marksman.	..	..	1st c. m.	m
"	Ryley, W..........	17	16	33	17	15	32	"				
"	Sattler, E. E	17	17	34	18	17	35	1st Cl. M.				
"	Shelley, O. W	20	20	40	14	13	27	Marksman.				
"	Spicer, W. L......	20	17	37	18	17	35	1st Cl. M.	..	s	s	s
"	Warren, C. E......	17	16	33	20	22	42	Sharps'r.	..	..	1st c. m.	1st c. m.

FOURTH REGIMENT.

FIELD, STAFF, AND NON-COMMISSIONED STAFF.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Colonel Henry Skinner	17	19	36	17	24	41	Sharps'r.	m'79 m'86			
Lieut.-Col. J. C. Crowe	20	19	39	20	21	41	"	..	..	V 1st c.m.	s
Major G. W. Cornell	19	20	39	21	20	41	"	..	X s	s	s
Major C. C. Godfrey, Surg.	24	22	46	23	22	45	"				
Captain E. Finn, I. R. P.	17	19	36	19	22	41	"	m '79 s '86	s		
1st Lieut. E. E. Crowe, P. M.	18	17	35	15	17	32	Marksman.				
Com. Sergt. F. A. Wood	18	16	34	18	15	33	"	..	..	..	1st c. m.

COMPANY B.

Captain	G. P. Sanger	20	19	39	20	21	41	Sharps'r.	..	V s	..	s
1st Lieut.	F. V. Gilhuley	14	15	29	20	20	40	"	V m '86	..	..	1st c. m.
2d Lieut.	M. F. White	20	18	38	17	23	40	"	..	..	V s	s
Q.-M. Sgt.	M. W. Green	19	15	34	20	20	40	"	..	s	1st c. m.	1st c. m.
Sergeant	B. Monahan	15	15	30	19	21	40	"	..	1st c. m.	s	s
"	W. Houlihan	18	21	39	19	22	41	V Sharps'r.	m '86	m	s	s
Corporal	C. A. Bradley	21	20	41	17	20	37	1st Cl. M.	..	..	..	s
Private	Lathrop, C. S	14	13	27	14	20	34	Marksman.	..	..	m	m
"	Loth, R	15	14	29	13	13	26	"				
"	Morgan, H. R	13	16	29	13	16	29	"				
"	Powell, I. L	21	19	40	16	20	36	"				
"	Riehl, C. P	13	16	29	13	17	30	"				
"	Romaine, M. B	15	18	33	17	22	39	V 1st Cl. M.	m'85 m'86	s	s	

COMPANY C.

Captain	W. F. Daniel	19	18	37	14	13	27	Marksman.	..	..	..	V m.
1st Lieut.	E. S. Walsh	16	17	33	14	13	27	"	..	..	..	V 1st c. m.
2d Lieut.	C. W. Hendrie	25	18	43	20	22	42	V Sharps'r.	s '86	s	1st c. m.	s
Sergeant	L. B. Carey	19	20	39	21	19	40	"	m '85 1st c.m. '86	m	..	s
"	F. A. Waldron	21	18	39	18	22	40	Sharps'r.	..	s	s	1st c. m.
"	H. C. Stockwell	23	21	44	20	21	41	"	..	s	s	s
"	A. E. Johnson	19	20	39	20	17	37	1st Cl. M.	..	s	s	s
Corporal	A. S. Pitt	19	13	32	16	17	33	Marksman.	..	m	1st c. m.	m
"	F. E. Alden	16	17	33	16	18	34	"	..	..	..	m
"	T. F. Hylan	14	15	29	15	15	30	"				
"	J. C. Turner	13	16	29	13	14	27	"				
"	L. D. Rinehart	20	16	36	15	15	30	"	..	..	..	m
Musician	J. S. St. John	15	15	30	13	14	27	"	..	..	1st c. m.	m
Private	Archibald, G	18	19	37	14	13	27	"				
"	Gaylor, L. B	21	23	44	17	18	35	1st Cl. M.	s '86	s	s	
"	Goulden, J. D	18	19	37	13	16	29	Marksman.				
"	Haddock, E	15	17	32	14	13	27	"				
"	Holly, W. H	18	15	33	16	20	36	"				
"	Hoyt, H. C	16	16	32	17	17	34	1st Cl. M.				
"	Lockwood, H. C	16	17	33	16	16	32	Marksman.				
"	Miller, E. C	22	22	44	17	19	36	1st Cl. M.				
"	Merritt, L. I	21	15	36	16	20	36	Marksman.				
"	Reed, W. C	16	16	32	15	15	30	"				
"	Smith, J. J	21	15	36	15	14	29	"				
"	Waterbury, R. L	13	15	28	13	14	27	"	..	..	m	1st c. m.

COMPANY D.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Captain	Russell Frost......	21	20	41	21	20	41	V Sharps'r.	s '86	s	s	s
1st. Lieut.	G. E. Simpson.....	20	20	41	17	19	36	V 1st Cl. M.	s '86	s	s	m
Q.-M. Sgt.	H. S. Ganung	22	16	38	21	21	42	Sharps'r.	m'84 m'85	..	..	s
Trump'r	J. W. Gorham.....	15	17	32	17	18	35	1st Cl. M.	s '86	1st c. m.	1st c. m.	
Private	Preece, R. W......	17	18	35	17	18	35	"	..	..	..	1st c. m.
"	Preece, B W......	18	20	38	18	16	34	"				
"	Sobey, J Jr.......	13	17	30	18	19	37	"				

COMPANY F.

1st Lieut.	Henry Matheis....	16	18	34	19	22	41	Sharps'r.	V s '86	s	1st c. m.	1st c. m.
2d Lieut.	E. G. Aiken.......	15	15	30	18	18	36	1st Cl. M.	..	..	..	V 1st c. m.
Sergeant	F. E. Pratt........	17	16	33	21	18	39	"	1st c.m.'86			
Corporal	T. Hunt...........	14	16	30	19	19	38	"	..	..	..	m
"	S. M. Sterling.....	17	15	32	17	18	35	"	..	..	..	m
"	F. E. Radie.......	15	13	28	20	15	35	Marksman.	..	..	m	m
"	L. F. Pollard......	15	15	30	19	18	37	1st Cl M.				
Musician	J. A. Carrier,......	15	22	37	17	18	35	"	..	s	m	m
Private	Smith, G. A.......	13	14	27	18	14	32	Marksman.				
"	Waters, A. S......	17	14	31	20	14	34	"	..	..	..	1st c. m.

COMPANY I.

Captain	H. S. Terrell	14	20	34	19	19	38	1st Cl. M.				
1st Lieut.	C. N. Parsons.....	14	15	29	13	16	29	Marksman.				
2d Lieut.	W. Maxwell.......	15	13	28	13	13	26	"				
1st Sergt.	W. H. Bramhall...	14	14	28	14	17	31	"				
Corporal	A. A. Johnson	13	14	27	20	18	38	1st Cl. M.	..	s		
"	O. W. White......	15	17	32	17	15	32	Marksman.				
Private	Couch, F..........	14	18	32	16	13	29	"				
"	Dutcher, M........	13	17	30	15	14	29	"				
"	Shay, F. M........	14	17	31	15	13	28	"				

FOURTH SIGNAL CORPS.

Private	Challenger, H. S...	21	16	37	19	20	39	1st Cl. M.				
"	Cogill, F. L.......	21	17	38	20	21	41	Sharps'r.				
"	Laidlaw, E. S	15	15	3	18	18	36	1st Cl. M.				

FOURTH MACHINE-GUN PLATOON.

Names.		2d Class.			1st Class.			Designation.	Previous Qualifications.			
		300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
2d Lieut.	G. P. Rand........	17	14	31	20	15	35	Marksman.	..	..	..	V m
Sergeant	F. S. Edwards.....	19	20	39	20	18	38	1st Cl. M.	..	..	..	V s
"	R. Paul...........	17	17	34	18	18	36	"	..	m	1st c. m.	1st c. m.
Corporal	E. T. Washbun....	16	20	36	22	15	37	Marksman.	..	m	m	1st c. m.
Private	Tomlinson, C. D..	13	13	26	20	19	39	1st Cl. M.	..	..	1st c. m.	
"	Wygant, J. A.....	13	17	30	22	17	39	"				

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, March 19, 1891.

GENERAL ORDERS,
No. 5.

I. Changes as follows in the commissioned officers of the CONNECTICUT NATIONAL GUARD have occurred since February 18, 1891:

RESIGNED AND DISCHARGED.

FIRST REGIMENT.

Captain William B. Dwight, Company K, February 25, 1891.

FOURTH REGIMENT.

Captain Stiles Judson, Jr., Company K, March 6, 1891.

PROMOTED AND APPOINTED.

FIRST REGIMENT.

Second Lieutenant Martin Laubscher, of Rockville, appointed First Lieutenant Company C, with rank from February 6, 1891, *vice* Linker, resigned.

First Sergeant Edwin L. Bolles, of Rockville, appointed Second Lieutenant Company C, with rank from February 6, 1891, *vice* Laubscher, promoted.

THIRD REGIMENT.

First Lieutenant Thomas O. Thompson, of New London, appointed Captain Company D, with rank from February 9, 1891, *vice* St. Clare, resigned.

Sergeant-Major David Connor, of New London, appointed First Lieutenant Company D, with rank from March 4, 1891, *vice* Thompson, promoted.

Private Wm. R. Beach, of New London, appointed Second Lieutenant Company D, with rank from March 4, 1891, *vice* Dart, resigned.

II. The following are announced as the figures of merit of each organization of the CONNECTICUT NATIONAL GUARD for the month of February, 1891, based on the drill reports for the month:

FIRST REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Mar. 2,	4	58	91.65
B.	Mar. 3,	4	65	89.30
C.	Mar. 3,	4	67	96.03
D.	Mar. 3,	3	68	95.59
E.	Mar. 3,	3	68	97.55
F.	Mar. 2,	4	57	86.42
G.	Mar. 2,	4	68	99.02
H.	Mar. 4,	4	67	94.53
I.	Mar. 2,	3	68	96.08
K.	Mar. 2,	4	55	88.78
Hosp. Corps.	Mar. 2,	4	5	96.67
1st Signal Corps.	Mar. 3,	4	10	96.67
1st M.-G. Plat.	Mar. 2,	4	9	91.67

Figure of merit of Regiment, **93.84**

SECOND REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Mar. 7, 9.00 A.M.	4	68	98.04
B.	Mar. 10, 9.00 A.M.	4	64	94.39
C.	Mar. 2, 4.00 P.M.	4	61	95.48
D.	Mar. 2, 9.00 A.M.	4	68	99.02
E.	Mar. 2, 4.00 P.M.	4	67	97.52
F.	Mar. 6, 9.00 A.M.	4	68	99.51
G.	Mar. 2, 9.00 A.M.	4	68	97.55
H.	Mar. 7, 7.00 P.M.	4	62	90.61
I.	Mar. 2, 11.00 A.M.	4	68	96.57
K.	Mar. 6, 7.00 P.M.	4	61	94.38
Hosp. Corps.	Mar. 2, 9.00 A.M.	4	5	95.00
2d Signal Corps.	Mar. 2, 11.00 A.M.	4	10	98.33
2d M.-G. Plat.	Mar. 2, 7.00 P.M.	4	9	99.07

Figure of merit of Regiment, **96.57**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	Mar. 3, 9.00 A.M.	4	51	83.17
B.	Mar. 2, 11.00 A.M.	4	68	93.14
C.	Mar. 2, 11.00 A.M.	4	64	91.79
D.	Mar. 1, 9.00 A.M.	4	58	82.45
E.	Mar. 3, 9.00 A.M.	4	61	83.46
F.	Mar. 5, 10.00 A.M.	4	54	85.73
G.	Mar. 2, 11.00 A.M.	4	59	85.98
I.	Mar. 2, 9.00 A.M.	4	62	92.76
Hosp. Corps.	Mar. 1, 9.00 A.M.	4	5	96.67
3d Signal Corps.	Mar. 3, 9.00 A.M.	4	9	94.02
3d M.-G. Plat.	Mar. 1, 9.00 A.M.	4	9	100.00

Figure of merit of Regiment, **89.92**

FOURTH REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	Mar. 4,	4	60	86.64
C.	Mar. 2,	3	40	80.44
D.	Mar. 9,	4	62	89.53
E.	Mar. 4,	4	60	87.19
F.	Mar. 5,	4	60	85.52
G.	Mar. 2,	4	58	85.90
I.	Mar. 2,	5	60	92.19
K.	Mar. 2,	4	58	80.73
Hosp. Corps.	Mar. 3,	4	4	89.17
4th Signal Corps.	Mar. 3,	4	10	85.00
4th M.-G. Plat.	Mar. 3,	4	9	100.00

Figure of merit of Regiment, **87.48**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Mar. 4, 9.00 A.M.	4	59	74.68
2d	Mar. 4, 9.00 A.M.	4	55	82.72

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Mar. 6,	2	22	67.89
2d	Mar. 5,	2	38	87.91
Figure of merit of Battery,				**77.90**

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, April 17, 1891.

GENERAL ORDERS,
No. 6.

I. The Court of Inquiry convened by S. O. No. 25, c. s., to examine into the capacity, qualifications, propriety of conduct, and efficiency of Captain William H. McLean, commanding Company H, First Regiment, C. N. G., having ably performed the duty assigned it and rendered its report, is hereby dissolved.

II. In accordance with the unanimous recommendation of the Court, the commission of Captain William H. McLean, Company H, First Regiment, C. N. G., is hereby revoked, and he is dismissed from the military service of the State.

III. The nomination of a Second Lieutenant, Company H, First Regiment, C. N. G., made at a meeting of the Company at its armory February 6, 1891, convened by Captain William H. McLean commanding, in compliance with Paragraph II, S. O. No. 13, A.-G. O., c. s., having been, on full investigation of the Court, discredited by reason of informalities and corrupt practices, is hereby disapproved.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, April 18, 1891.

GENERAL ORDERS,
No. 7.

I. Changes as follows in the commissioned officers of the CONNECTICUT NATIONAL GUARD have occurred since March 19, 1891:

RESIGNED AND DISCHARGED.

FOURTH REGIMENT.

Captain Frank R. Nash, Company G, March 23, 1891.

COMMISSION REVOKED AND DISMISSED.

FIRST REGIMENT.

Captain William H. McLean, Company H, April 17, 1891.

PROMOTED AND APPOINTED.

FIRST REGIMENT.

First Lieutenant Charles H. Slocum of Windsor, appointed Captain Company K, with rank from March 9, 1891, *vice* Dwight, resigned.

Second Lieutenant Henry H. Saunders of Hartford, appointed First Lieutenant Company K, with rank from March 9, 1891, *vice* Slocum, promoted.

First Sergeant Edward H. Waterman of Hartford, appointed second Lieutenant Company K, with rank from March 9, 1891, *vice* Saunders, promoted.

First Lieutenant Martin Laubscher of Rockville, appointed Captain Company C, with rank from March 20, 1891, *vice* Dickinson, resigned.

Second Lieutenant Edwin L. Bolles of Rockville, appointed First Lieutenant Company C, with rank from March 20, 1891, *vice* Laubscher, promoted.

Quartermaster-Sergeant Harry M. Loomis of Rockville, appointed Second Lieutenant Company C, with rank from March 20, 1891, *vice* Bolles, promoted.

Fourth Regiment.

First Lieutenant George T. Jewell of Stratford, appointed Captain Company K, with rank from March 19, 1891, *vice* Judson, resigned.

Second Lieutenant William B. Bristol of Stratford, appointed First Lieutenant Company K, with rank from March 19, 1891, *vice* Jewell, promoted.

First Sergeant William H. Fryer of Stratford, appointed Second Lieutenant Company K, with rank from March 19, 1891, *vice* Bristol, promoted.

II. The following are announced as the figures of merit of each organization of the CONNECTICUT NATIONAL GUARD for the month of March, 1891, based on the drill reports for the month:

FIRST REGIMENT.					SECOND REGIMENT.				
Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.	Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	April 1,	4	60	93.30	A.	April 4, 9.00 A.M.	5	68	98.53
B.	April 2,	4	60	88.30	B.	April 9, 9.00 A.M.	4	66	97.00
C.	April 2,	4	68	99.26	C.	April 2, 8.00 A.M.	5	62	95.45
D.	April 2,	5	68	97.06	D.	April 1, 4.00 P.M.	4	68	98.65
E.	April 2,	5	68	98.04	E.	April 2, 8.00 A.M.	5	67	97.52
F.	April 2,	4	56	83.40	F.	April 6, 9.00 A.M.	4	67	98.02
G.	April 1,	5	68	99.51	G.	April 3, 9.00 A.M.	5	68	96.57
H.	April 2,	4	66	90.43	H.	April 6, 9.00 A.M.	5	63	91.20
I.	April 1,	4	68	93.63	I.	April 2, 8.00 A.M.	4	67	97.02
K.	April 1,	5	52	87.03	K.	April 3, 11.00 A.M.	4	58	93.37
Hosp. Corps.					Hosp. Corps.				
	April 3,		5	95.83		April 3, 8.00 A.M.	4	5	90.00
1st Signal Corps.					2d Signal Corps.				
	April 7,	5	10	100.00		April 3, 11.00 A.M.	5	10	98.67
1st M.-G. Plat.					2d M.-G. Plat.				
	April 3,	4	9	91.67		April 1, 4.00 P.M.	4	9	98.15
Figure of merit of Regiment,				**93.65**	Figure of merit of Regiment,				**96.17**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	April 1, 9.00 A.M.	4	53	81.95
B.	April 1, 9.00 A.M.	5	66	93.46
C.	April 2, 5.00 P.M.	5	64	91.27
D.	April 1, 9.00 A.M.	4	59	80.90
E.	April 3, 9.00 A.M.	4	58	81.88
F.	April 4, 9.00 A.M.	5	53	80.70
G.	April 1, 9.00 A.M.	4	58	84.18
I.	April 1, 1.00 P.M.	5	64	92.31
Hosp. Corps.	April 1, 3.00 P.M.	5	5	100.00
3d Signal Corps.	April 2, 3.00 P.M.	4	10	94.04
3d M.-G. Plat.	April 1, 6.00 P.M.	4	9	100.00

Figure of merit of Regiment, **89.15**

FOURTH REGIMENT.

Companies	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	April 4,	5	61	87.27
C.	April 1,	5	55	85.26
D.	April 7,	4	60	89.97
E.	April 4,	5	61	88.92
F.	April 2,	5	57	84.08
G.	April 6,	5	55	85.04
I.	April 3,	5	62	92.22
K.	April 2,	5	57	78.82
Hosp. Corps.	April 1,	4	5	93.07
4th Signal Corps.	April 1,	4	9	89.40
4th M.-G. Plat.	April 1,	4	9	98.15

Figure of merit of Regiment, **88.38**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Apr. 10, 11.00 A.M.	4	59	75.25
2d	Apr. 4, 9.00 A.M.	4	54	83.26

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	Apr. 3,	2	23	75.22
2d	Apr. 2,	2	38	93.17

Figure of merit of Battery, **84.20**

III. Private Daniel W. Bailey, Company B, Fourth Regiment, C. N. G., has been discharged for the benefit of the service, from the military service of the State, in accordance with sentence of Field Officer's Court-Martial.

IV. Private Luzerne C. Waite, Company G, Third Regiment, C. N. G., has been dishonorably discharged from the military service of the State, in accordance with sentence of Field Officer's Court-Martial.

V. The following-named member of the National Guard is announced as having qualified in all classes Rifle Practice as required during the season of 1890, in accordance with Art. XXVII, Regulations C. N. G., in addition to those published in General Orders No. 4, c. s., and is awarded the State decoration,

THIRD REGIMENT.

COMPANY I.

NAMES.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Starr, L. H., ...	13	15	28	20	17	37	1st cl. m.				1st c. m.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, April 22, 1891.

GENERAL ORDERS,
No. 8.

I. The companies of infantry, Hospital Corps, Signal Corps, Machine-Gun Platoons, and Platoons of Light Artillery, National Guard, will each parade one day during the month of May, *proximo*, in their respective towns, under order of the Regimental, Battery, or Separate Company commander. Organizations will devote a portion of the day to rifle practice, under orders of the commandant and supervision of the regimental Inspector of Rifle Practice, and the rest of the day to such drill as the commandant shall direct, including instruction in guard duty and skirmish drill.

II. Regimental and battery commanders will attend the parades of companies and platoons in person, or be represented by a field officer, and will report in writing through Brigade Headquarters *on or before June 1*, *proximo*, the condition and efficiency of each company, the rifle practice and drill and maneuvers performed, time occupied in rifle practice, time devoted to drill, and the number in each organization present and performing duty.

III. The commanding officer of each Separate Company, A and B, will report to the commanding officer of the regiment in whose district his command is located, the date fixed for the parade of his company; when such regimental commander will detail a field officer of his regiment to attend the parade of such Separate Company and report as provided in Par. II.

IV. The commanding officer of each company Governor's Guards is hereby directed to assemble his command for one day's drill and parade on such date as he may determine prior to May 31st, *proximo;* forwarding to this office, when issued, a copy of his order designating the date of parade.

V. Triplicate muster-pay-rolls for duty, duly signed by each member parading, and sworn to by the commanding officer, will be required, one copy to be retained by the commanding officer, and two copies to be forwarded to this office within ten days from the date of the parade.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, April 23, 1891.

GENERAL ORDERS,
No. 9.

I. An Examining Board for the examination of officers of the Connecticut National Guard, in accordance with law, will convene at Headquarters Room, Second Regiment Armory, New Haven, Tuesday, May 12th, *proximo*, at 10 o'clock A. M., and will make return to this office of the name and rank of each officer examined, and the result of such examination in detail.

The examination will be conducted in a thorough manner and strictly in accordance with Section 4, Article XXV, Regulations C. N. G., 1884; especial attention being given to guard duty and skirmish drill.

II. The Board will consist of Colonel Walter J. Leavenworth, of Wallingford; Maj. Thomas T. Welles, of New Haven; and Captain Timothy F. Callahan, of New Haven.

III. The following-named officers are hereby ordered to appear before the said Board for examination, reporting in fatigue uniform, without side-arms.

The officers designated from the First Regiment will report for examination Tuesday, May 12th; those from the Third Regiment on Thursday.

May 14th; those from the Fourth Regiment on Friday, May 15th; and all other officers designated will report on Tuesday, May 19th.

FIRST REGIMENT.

Major JOHN HICKEY, Captain MARTIN LAUBSCHER, Captain CHARLES L. BISSELL, Captain LYMAN S. BURR, Captain CHARLES H. SLOCUM.

First Lieutenant WILLIAM C. HERTER, First Lieutenant EDWIN L. BOLLES, First Lieutenant CHARLES CHENEY, First Lieutenant CHARLES H. PATTERSON, First Lieutenant CHARLES H. MOORE, First Lieutenant HENRY H. SAUNDERS.

Second Lieutenant HARRY M. LOOMIS, Second Lieutenant JOHN E. LYNCH, Second Lieutenant LOUIS N. MANSUY, Second Lieutenant WESLEY B. PORTER, Second Lieutenant JOSEPH R. ANDREWS, Second Lieutenant EDWARD H. WATERMAN.

SECOND REGIMENT.

First Lieutenant FREDERICK L. LEHR, First Lieutenant EDWARD V. RAYNOLDS.

Second Lieutenant HENRY S. HAMILTON.

THIRD REGIMENT.

First Lieutenant FREDERICK FARNSWORTH, Paymaster; First Lieutenant JULIAN LAPIERRE, Assistant Surgeon.

Captain THOMAS O. THOMPSON, Captain HENRY J. THAYER, Captain GEORGE W. METCALF.

First Lieutenant HENRY S. DORSEY, First Lieutenant DAVID CONNOR, First Lieutenant LUCIUS H. FULLER, First Lieutenant SAMUEL PRINCE.

Second Lieutenant JEREMIAH DILLON, Second Lieutenant WILLIAM R. BEACH, Second Lieutenant DAVID FLAGG, Second Lieutenant CHARLES A. MINER, Second Lieutenant HENRY L. STARR.

FOURTH REGIMENT.

Captain GEORGE S. ROWE, Adjutant; Captain EDWARD FINN, I. R. P.; First Lieutenant WILBUR S. WATSON, Assistant Surgeon.

Captain REUBEN M. ROSE, Captain CARROLL D. RYDER, Captain GEORGE T. JEWELL.

First Lieutenant HERMAN M. ERIKSSON, First Lieutenant CHARLES N. PARSONS, First Lieutenant WILLIAM B. BRISTOL, First Lieutenant FRANK M. COGILL.

Second Lieutenant MERRITT F. WHITE, Second Lieutenant CHARLES W. HENDRIE, Second Lieutenant EDWARD G. AIKEN, Second Lieutenant JOHN V. SCOFIELD, Second Lieutenant WILLIAM MAXWELL, Second Lieutenant WILLIAM H. FRYER.

SEPARATE COMPANIES.

Captain EVERETT W. FREEMAN.
First Lieutenant WATKINS W. CHRISTIAN.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, April 24, 1891.

GENERAL ORDERS,
No. 10.

I. It is with most profound sorrow that the Commander-in-Chief announces the death of Major JOHN C. KINNEY, Commander of the First Company Governor's Foot Guards, which occurred at his home in Hartford, at 8 o'clock P. M., on the 22d instant.

Major Kinney's military service began almost immediately on his graduation from Yale College, in 1861. He enlisted in November, 1861, in the Thirteenth Regiment Connecticut Volunteers, and on January 11th, 1862, was mustered into service as Sergeant in Company K of that Regiment. He was promoted First Sergeant, Company A, June 1st, 1862; Second Lieutenant, September 1st, 1862; was wounded in action at Irish Bend, Louisiana, April 14th, 1863; was mustered as Second Lieutenant, May 7th, 1863; promoted First Lieutenant Company I, Thirteenth Connecticut Volunteers, March 17th, 1864. On May 1st, 1864, he was detached as Signal Officer, and served in that capacity with Admiral Farragut on the Flag Ship Hartford throughout the memorable battle of Mobile Bay, August 5th, 1864. While absent from his Volunteer organization on this detail to signal officer's duty, the time of service of the original members of the Thirteenth Regiment expired, the Regiment was mustered out of service, and the reenlisted men and recruits were organized in a battalion of five companies known as the Thirteenth Battalion Connecticut Volunteers. He was nominally transferred to Company B of this battalion, but continued on detail until final discharge from service August 21st, 1865. He had thus a record of arduous duty, faithfully and intelligently performed, and covering almost the entire period of the civil war.

On January 30th, 1882, he was appointed and commissioned Major commanding the oldest military organization in continuous service in America, the FIRST COMPANY GOVERNOR'S FOOT GUARDS, of Hartford. To this command Major Kinney brought the tireless energy and the wise discretion, which characterized his every undertaking, with the result of making his command as widely and favorably known as any organization of citizen soldiery in the land.

II. As a mark of respect to his memory, it is hereby ordered that the United States flags on the Arsenal and the public buildings of the State be displayed at half-staff until after the funeral.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

Adjutant-General's Office,

Hartford, May 11, 1891.

General Orders,
No. 11.

I. The Court of Inquiry convened by S. O. No. 35, c. s., to examine into the propriety of conduct of First Lieutenant Henry Matheis, Company F, 4th Regt., Connecticut National Guard, having performed the duty assigned it, and rendered its report, is hereby dissolved.

II. In accordance with the unanimous recommendation of the court the commission of First Lieutenant Henry Matheis is hereby revoked, and he is dismissed from the Military Service of the State.

III. So much of G. O. No. 4, A. G. O., c. s., as relates to the qualification for State decorations by members of Company F, 4th Regt., Connecticut National Guard, is hereby annulled because of evident irregularities in such qualification for 1890.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

Adjutant-General's Office,

Hartford, May 20, 1891.

General Orders,
No. 12.

I. Changes as follows in the commissioned officers of the Connecticut National Guard have occurred since April 18, 1891:

RESIGNED AND DISCHARGED.

First Regiment.

First Lieutenant Morris Penrose, First Signal Corps, April 27, 1891.

Third Regiment.

First Lieutenant Kent A. Darbie, Company F, May 6, 1891.

Fourth Regiment.

First Lieutenant Frank M. Cogill, Fourth Signal Corps, April 27, 1891.

Separate Companies.

Second Lieutenant George F. Freeman, Second Separate Company, April 27, 1891.

COMMISSION REVOKED AND DISMISSED.

Fourth Regiment.

First Lieutenant Henry Matheis, Company F, May 11, 1891.

PROMOTED AND APPOINTED.

Fourth Regiment.

First Lieutenant Carroll D. Ryder, of Danbury, appointed Captain Company G, with rank from March 31, 1891, *vice* Nash, resigned.

First Sergeant Herman M. Eriksson, of Danbury, appointed First Lieutenant Company G, with rank from March 31, 1891, *vice* Ryder, promoted.

II. The following are announced as the figures of merit of each organization of the Connecticut National Guard for the month of April, 1891, based on the drill reports for the month:

FIRST REGIMENT.				SECOND REGIMENT.			
Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.	Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	May 1,	5	62	94.37	A.	May 3, 9.00 A.M.	4	68	98.04
B.	May 1,	5	58	83.60	B.	May 5, 9.00 A.M.	4	66	94.98
C.	May 2,	4	68	99.51	C.	May 2, 11.00 A.M.	4	68	96.57
D.	May 2,	4	68	97.55	D.	May 1, 9.00 A.M.	4	68	99.02
E.	May 1,	4	68	99.51	E.	May 4, 8.00 A.M.	4	67	98.02
F.	May 1,	4	55	85.75	F.	May 3, 10.00 A.M.	5	65	96.99
G.	May 1,	4	68	99.63	G.	May 2, 9.00 A.M.	4	67	96.03
H.	May 2,	4	66	88.41	H.	May 4, 8.00 P.M.	4	65	91.86
I.	May 2,	5	68	94.12	I.	May 4, 8.00 A.M.	5	66	95.99
K.	May 1,	4	52	87.67	K.	May 6,	5	59	93.33
Hosp. Corps.	May 2,	4	5	95.00	Hosp. Corps.	May 2, 9.00 A.M.	5	5	92.00
1st Signal Corps.	May 1,	4	10	94.35	2d Signal Corps.	May 2, 11.00 A.M.	4	10	99.17
1st M.-G. Plat.	May 1,	5	9	93.33	2d M.-G. Plat.	May 4, 2.00 P.M.	4	9	99.07
Figure of merit of Regiment,				**93.29**	Figure of merit of Regiment,				**96.23**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	May 3, 9.00 A.M.	5	53	80.70
B.	May 2, 9.00 A.M.	4	66	92.96
C.	May 2, 1.00 P.M.	4	66	94.47
D.	May 1, 9.00 A.M.	4	46	76.17
E.	May 3, 9.00 A.M.	5	58	84.75
F.	May 5, 9.00 A.M.	4	52	76.13
G.	May 1, 6.00 P.M.	5	56	85.19
I.	May 2, 1.00 P.M.	4	65	90.81
Hosp. Corps.	May 1, 5.00 P.M.	4	5	100.00
3d Signal Corps.	May 1, 9.00 A.M.	4	10	93.33
3d M.-G. Plat.	May 1, 9.00 A.M.	5	9	99.26
Figure of merit of Regiment,				**88.52**

FOURTH REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	May 4,	4	59	87.11
C.	May 1,	4	54	84.49
D.	May 5,	4	64	90.75
E.	May 1,	4	61	88.92
F.	May 2,	4	59	83.72
G.	May 4,	4	55	83.93
I.	May 1,	4	63	93.32
K.	May 4	4	57	78.82
Hosp. Corps.	May 1,	5	5	94.67
4th Signal Corps.	May 1,	5	9	84.81
4th M.-G. Plat.	May 2,	4	9	98.52
Figure of merit of Regiment,				**88.10**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	May 4, 6.00 P.M.	4	58	75.56
2d	May 5, 9.00 P.M.	5	53	78.81

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	May 2,	2	26	74.98
2d	May 2,	2	40	90.85
Figure of merit of Battery,				**82.92**

III. The figure of merit for month of March last of Company D, Fourth Regiment, and of the Fourth Regiment, Connecticut National Guard, as published in General Orders No. 7, c. s., are hereby corrected to 90.07 and **88.39**, respectively.

IV. So much of General Orders No. 4, c. s., as pertains to the qualifications of Private C. W. Button, of Co. D, First Regiment, C. N. G., is amended as follows :

Names.	2d Class.			1st Class.			Designation.	Previous Qualifications.			
	300 Yds.	400 Yds.	Total.	200 Yds.	500 Yds.	Total.	1890.	1878-86.	1887.	1888.	1889.
Private Button, C. W.,	14	16	30	17	14	31	Marksm'n.				

V. The following-named members of the National Guard have been dishonorably discharged from the military service of the State, in accordance with sentence of Field Officers' Courts-martial, viz.:

THIRD REGIMENT.

Company C—Private Elias H. Sheppard.

Company D—Private Albert A. Burgess, Private Richard T. Cullen, Private William J. Cullen, Private James Elliott, Jr.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

Adjutant-General's Office,
Hartford, May 26, 1891.

General Orders,
No. 13.

I. The following-named officers of the Connecticut National Guard have passed a satisfactory examination by the board convened by G. O., No. 9, c. s., and will be commissioned with rank and date as given herewith:

First Regiment.

Major	John Hickey,	So. Manchester,	Oct. 30, 1890
Captain	Martin Laubscher,	Co. C, Rockville,	Mch. 20, 1891
Captain	Charles L. Bissell,	Co. G, S. Manchester,	Nov. 20, 1890
Captain	Charles H. Slocum,	Co. K, Windsor,	Mch. 9, 1891
First Lieutenant	William C. Herter,	Co. A, Hartford,	Jan. 16, 1891
First Lieutenant	Edwin L. Bolles,	Co. C, Rockville,	Mch. 20, 1891
First Lieutenant	Chas. H. Patterson,	Co. H, Hartford,	Jan. 22, 1891
First Lieutenant	Charles H. Moore,	Co. I, New Britain,	Aug. 15, 1890

First Lieutenant	Henry H. Saunders,	Co. K, Hartford,	Mch. 9, 1891
Second Lieut.	Harry M. Loomis,	Co. C, Rockville,	Mch. 20, 1891
Second Lieut.	John E. Lynch,	Co. E, New Britain,	Nov. 25, 1890
Second Lieut.	Louis N. Mansuy,	Co. F, Hartford,	Oct. 8, 1890
Second Lieut.	Wesley B. Porter,	Co. G, S. Manchester,	Nov. 20, 1890
Second Lieut.	Joseph R. Andrews,	Co. I, New Britain,	Aug. 15, 1890
Second Lieut.	Edw. H. Waterman,	Co. K, Hartford,	Mch. 9, 1991

SECOND REGIMENT.

First Lieutenant	Frederick L. Lehr,	Co. E, New Haven,	Sept. 30, 1890
First Lieutenant	Edward V. Raynolds,	Co. F, New Haven,	May 26, 1890

THIRD REGIMENT.

First Lieutenant	Fred. Farnsworth,	Pay'r, N. London,	June 15, 1890
First Lieutenant	Julius La Pierre,	A. Surg'n, Norwich,	July 24, 1890
Captain	Thomas O. Thompson,	Co. D, New London,	Feb. 9, 1891
Captain	Henry J. Thayer,	Co. G, Putnam,	Dec. 11, 1890
First Lieutenant	Henry S. Dorsey,	Co. A, N. London,	Jan. 28, 1891
First Lieutenant	David Connor,	Co. D, N. London,	Mch. 4, 1891
First Lieutenant	Samuel Prince,	Co. I, N. London,	Jan. 27, 1891
Second Lieut.	Jeremiah Dillon,	Co. A, N. London,	Jan. 28, 1891
Second Lieut.	William R. Beach,	Co. D, N. London,	Mch. 4, 1891
Second Lieut.	Charles A. Miner,	Co. I, N. London,	Jan. 27, 1891
Second Lieut.	Henry L. Starr,	3d M-G.P., N. London,	Nov. 12, 1890

FOURTH REGIMENT.

Captain	Edward Finn,	I.R.P., W. Winsted,	July 24, 1890
First Lieutenant	Wilbur S. Watson,	A. Surg'n, Danbury,	July 24, 1890
Captain	Carroll D. Ryder,	Co. G, Danbury,	Mch. 31, 1891
Captain	George T. Jewell,	Co. K, Stratford,	Mch. 19, 1891
First Lieutenant	Herman M. Eriksson,	Co G, Danbury,	Mch. 31, 1891
First Lieutenant	Charles N. Parsons,	Co. I, W. Winsted,	Sept. 29, 1890
First Lieutenant	William B. Bristol,	Co. K, Stratford,	Mch. 19, 1891
Second Lieut.	Merritt F. White,	Co. B, Bridgeport,	June 3, 1890
Second Lieut.	Charles W. Hendrie,	Co. C, Stamford,	June 27, 1890
Second Lieut.	Edward G. Aiken,	Co. F, Norwalk,	July 29, 1890
Second Lieut.	John V. Scofield,	Co. G, Danbury,	May 20, 1890
Second Lieut.	William Maxwell,	Co. I, W. Winsted,	Sept. 29, 1890
Second Lieut.	William H. Fryer,	Co. K, Stratford,	Mar. 19, 1891

SEPARATE COMPANIES.

Captain	Everett W. Freeman,	2d S. C., Hartford,	Aug. 11, 1890
First Lieut.	Watkins W. Christian,	2d S. C., Hartford,	Aug. 11, 1890

II. The following-named officers of the National Guard, failing to pass a satisfactory examination, will, in accordance with the recommendation of the Board be allowed a second examination:

Captain	Lyman S. Burr,	Co. I,	1st Reg't.
Captain	Reuben M. Rose,	Co. F,	4th Reg't.
Second Lieut.	Henry S. Hamilton,	Co. E,	2d Reg't.

III. The following-named officers having failed to pass a satisfactory examination, their appointments are hereby revoked, and they are severally discharged from the military service of the State, to date May 26, 1891:

Captain	Geo. W. Metcalf,	Co. I,	3d Reg't.
Second Lieut.	David Flagg,	Co. G,	3d Reg't.

IV. The following-named officers, having been granted leave of absence, will be subject to examination at the next meeting of the Board:

First Lieut.	Charles Cheney,	Co. G,	1st Reg't.
First Lieut.	Lucius H. Fuller,	Co. G,	3d Reg't.

V. Captain George S. Rowe, Adjutant Fourth Regiment, C. N. G., having failed to appear for examination as directed in G. O. No. 9, c. s., or to render any excuse for such failure to appear, his appointment is hereby revoked, and he is discharged from the military service of the State.

VI. The commanding officer of each company in which a vacancy is created by this order, is hereby ordered to warn the members of the Company to appear at their Armory to make nomination by ballot to fill the vacancy, and in like manner make nomination for any vacancies in the commissioned offices of said Company, occurring by reason of the nomination herein ordered, and make return of the nominations so made to this office without delay; transmitting therewith one of his original orders issued in compliance herewith.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, Conn., May 26, 1891.

GENERAL ORDERS,
No. 14.

I. Because of evident irregularities in the drill reports of the Hospital Corps, First Regiment, Connecticut National Guard, as indicated in the special report of Major P. H. Ingalls, Brigade Inspector, and confirmed to the A.-G. O. by the explanation of the Commander of the Regiment, all drill reports of that Corps are hereby annulled, and expunged from the records of this office, and the First Regiment, C. N. G., is re-rated as follows:

1891, January, 84.07; February, 86.41; March, 86.28; April, 85.98.

II. The zeal that misinterpreted the drill orders of 1890–1, (General Orders, No. 22, A.-G. O., dated October 10, 1890, and General Orders, No. 10, Headquarters Brigade, C. N. G., dated October 18, 1890,) substituting hours of "study" for hours of *drill*, is, to say the least, not commendable. It is matter for surprise that so capable an officer as Captain F. C. Wilson, Adjutant First Regiment, C. N. G., who it is understood compiled the reports, should have laid himself liable to censure for so flagrant a transgression of the letter and spirit of orders for the drill season.

III. A re-organization of the Hospital Corps, First Regiment, C. N. G., is hereby directed; all members thereof to be residents of the City of Hartford.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, June 27, 1891.

GENERAL ORDERS,
No. 15.

I. Changes as follows in the commissioned officers of the CONNECTICUT NATIONAL GUARD have occurred since May 20, 1891:

RESIGNED AND DISCHARGED.

SECOND REGIMENT.

Captain Charles L. Stocking, Company A, June 17, 1891.
Captain John Shuster, Company D, June 9, 1891.
Captain Theodore H. Sucher, Company E, June 16, 1891.
Second Lieutenant Theodore H. Macdonald, Company F, June 20, 1891.
Second Lieutenant Henry Norton, Jr., Company K, June 17, 1891.

THIRD REGIMENT.

Lieutenant-Colonel Michael Twomey, June 20, 1891.

APPOINTMENT REVOKED AND DISCHARGED.

THIRD REGIMENT.

Captain George W. Metcalf, Company I, May 26, 1891.
Second Lieutenant David Flagg, Company G, May 26, 1891.

FOURTH REGIMENT.

Captain George S. Rowe, Adjutant, May 26, 1891.

PROMOTED AND APPOINTED.

FIRST REGIMENT.

Sergeant Howard A. Giddings, of Hartford, appointed First Lieutenant Commanding First Signal Corps, with rank from May 8, 1891, *vice* Penrose, resigned.

THIRD REGIMENT.

Clinton A. Winslow, of Putnam, appointed Second Lieutenant Company G, with rank from June 4, 1891, *vice* Flagg, discharged.

George W. Metcalf, of New London, appointed Captain Company I, with rank from June 9, 1891, *vice* Metcalf, discharged.

FOURTH REGIMENT.

Captain Edward Finn, of Winsted, appointed Adjutant, with rank from May 28, 1891, *vice* Rowe, discharged.

Sergeant Owen Burns, of Bridgeport, appointed First Lieutenant Commanding Fourth Signal Corps, with rank from May 11, 1891, *vice* Cogill, resigned.

SECOND SEPARATE COMPANY.

First Sergeant Albert E. Smith, of Hartford, appointed Second Lieutenant, with rank from May 8, 1891, *vice* Freeman, resigned.

APPOINTMENT.

Captain Lyman S. Burr, Company I, First Regiment, appointed Judge Advocate, First Regimental District, with rank of Major, from June 15, 1891.

II. The following are announced as the figures of merit of each organization of the CONNECTICUT NATIONAL GUARD for the month of May, 1891, based on the drill reports for the month:

FIRST REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	June 1,	5	66	97.00
B.	June 2,	4	60	89.97
C.	June 1,	6	68	99.43
D.	June 1,	5	68	96.57
E.	June 1,	4	68	100.00
F.	June 3,	5	53	85.73
G.	June 1,	4	68	99.26
H.	June 2,	5	64	93.35
I.	June 1,	4	68	96.08
K.	June 1,	5	53	88.24
Hosp. Corps.	June 2,	4	4	93.33
1st Signal Corps.	June 1,	5	9	96.58
1st M.-G. Plat.	June 3,	4	9	94.44
Figure of merit of Regiment,				**94.61**

SECOND REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	June 3, 7.00 A.M.	5	68	98.53
B.	June 9, 9.00 A.M.	4	67	95.53
C.	June 4, 9.00 A.M.	4	65	98.02
D.	June 2, 9.00 A.M.	5	68	98.63
E.	June 3, 4.00 P.M.	4	68	98.64
F.	June 8, 9.00 A.M.	5	67	96 52
G.	June 1, 9.00 A.M.	5	65	97.50
H.	June 6, 3 00 P.M.	4	64	92.83
I.	June 9, 9.00 A.M.	5	66	98.01
K.	June 2, 7.00 P.M.	4	61	93.84
Hosp. Corps.	June 2, 7.00 P.M.	4	5	100.00
2d Signal Corps.	June 1, 11.00 A.M.	6	10	98.89
2d M.-G. Plat.	June 2, 4.00 P.M.	6	9	100.00
Figure of merit of Regiment,				**97.46**

THIRD REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
A.	June 2, 9.00 P.M.	4	53	84.47
B.	June 1, 3.00 P.M.	5	65	94.94
C.	June 1, 3.00 P.M.	5	66	95.99
D.	June 1, 9.00 A.M.	5	46	77.62
E.	June 2, 3.00 P.M.	5	61	88.37
F.	June 3, 9.00 A.M.	4	53	83.21
G.	June 1, 3.00 P.M.	5	54	87.58
I.	June 2, 6.00 P.M.	5	65	94.43
Hosp. Corps.	June 1, 9.00 A.M.	6	5	100.00
3d Signal Corps.	June 2, 9.00 A.M.	5	10	95.33
3d M.-G. Plat.	June 1, 9.00 A.M.	5	9	100.00
Figure of merit of Regiment,				**91.09**

FOURTH REGIMENT.

Companies.	Received at Regimental Headquarters.	No. of Drills.	Av. Mem'ship.	Figure of Merit.
B.	June 3, 11.00 A.M.	5	60	90.52
C.	June 6, 9.00 P.M.	5	54	85.11
D.	June 2, 10.30 A.M.	5	67	92.54
E.	June 4, 8.00 A.M.	5	64	90.75
F.	June 5, 2.00 P.M.	5	59	83.72
G.	June 3, 8.00 A.M.	5	55	85.14
I.	June 1, 7.30 P.M.	5	65	95.97
K.	June 3,	5	58	80.73
Hosp. Corps.	June 1,	4	5	100.00
4th Signal Corps.	June 2, 8.00 A.M.	4	10	93.18
4th M.-G. Plat.	June 2,	4	9	99.07
Figure of merit of Regiment,				**90.61**

SEPARATE COMPANIES.

	Received at Brigade Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	June 5, 11.00 A.M.	6	60	78.30
2d	June 2, 3.00 P.M.	5	55	85.11

BATTERY A.

Platoons.	Received at Battery Headquarters.	No. of Drills.	Average Membership.	Figure of Merit.
1st	June 5,	3	30	82.17
2d	June 2,	3	40	91.69
Figure of merit of Battery,				**86.93**

III. The figures of merit of organization of the Connecticut National Guard for the drill season November 1, 1890, to May 31, 1891, are as follows:

Brigade,		**85.56**
Second Regiment,	96.14	
Third "	88.70	
First "	88.43	
Fourth "	85.03	
Second Separate Company,	82.40	
Battery A,	81.45	
First Separate Company,	76.80	

COMPANIES OF INFANTRY.

1.	Co. D, 2d Regiment,	98.76	20.	Co. H, 2d Regiment,	91.34
2.	" A, 2d "	98.36	21.	" H, 1st "	90.39
3.	" C, 1st "	97.50	22.	" D, 4th, "	88.99
4.	" E, 2d "	97.16	23.	" K, 1st "	88.29
5.	" G, 2d "	97.12	24.	" F, 1st "	87.85
6.	" G, 1st "	97.04	25.	" E, 4th "	87.25
7.	" I, 2d "	96.96	26.	" B, 1st "	86.76
8.	" C, 2d "	95.60	27.	" B, 4th "	86.58
9.	" F, 2d "	95.43	28.	" F, 4th "	85.84
10.	" E, 1st "	94.76	29.	" E, 3d "	84.77
11.	" B, 2d "	94.57	30.	" G, 4th "	84.21
12.	" K, 2d "	93.86	31.	" G, 3d "	82.99
13.	" I, 1st "	93.78	32.	2d Separate Company,	82.40
14.	" D, 1st "	93.54	33.	Co. A, 3d Regiment,	81.77
15.	" I, 3d "	93.18	34.	" F, 3d "	81.45
16.	" B, 3d "	92.86	35.	" D, 3d "	80.89
17.	" I, 4th "	92.34	36.	" K, 4th "	80.74
18.	" A, 1st "	91.89	37.	1st Separate Company,	76.80
19.	" C, 3d "	91.43	38.	Co. C, 4th Regiment,	72.03

PLATOONS OF ARTILLERY.

Second Platoon, Battery A (Branford),	91.69
First Platoon, Battery A (Guilford),	82.17

HOSPITAL CORPS.

Hospital Corps, 3d Regiment,	99.00
" " 2d "	94.60
" " 1st "	*93.33
" " 4th "	91.97

SIGNAL CORPS.

Second Signal Corps, 2d Regiment,	98.30
First " " 1st "	97.16
Third " " 3d "	91.65
Fourth " " 4th "	71.29

MACHINE-GUN PLATOONS.

Third Machine-Gun Platoon, 3d Regiment,	99.23
Fourth " " 4th "	98.23
Second " " 2d "	97.64
First " " 1st "	91.40

* Record for Month of May, only.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, July 1, 1891.

GENERAL ORDERS,
No. 16.

I. The recent requisition of the Mayor of the City of Bridgeport for aid to support the civil authority, has suggested anew the vital importance of being fully prepared to meet *promptly* such a call. Therefore, the attention of all company commanders is hereby specially called to *paragraph 342*, Regulations Connecticut National Guard, and Regimental Commanders are charged to, at once, ascertain if the demands of said paragraph are complied with in all the organizations of their command. A study of the law and regulations relating to such calls, and the requirements and responsibilities of such an emergency tour of duty, is commended to all officers of the Connecticut National Guard, especially paragraphs 23–24–411–1490–1491, and 1908 to 1970 inclusive.

II. As a test of the very necessary condition indicated, and as a midsummer drill, regimental and company commanders, or senior officers in localities, will hold themselves in readiness to assemble their commands upon telegraphic orders from the Commander-in-Chief. Upon any such drill being ordered, the officer receiving such order will within twenty-four hours thereafter report to the Commander-in-Chief, through regular channels, the hour of receipt of order, hour of its promulgation, and the hour when the command ordered was assembled with at least fifty per cent. of its maximum strength "present for duty."

III. *Cartridge shells* will be procured, placed in boxes as near like the sealed ammunition in the hands of Company Commanders as possible, and a part of the drill will be the distribution of this representative ammunition to the men. They will not be considered *ready for duty* until each man in line has at least ten rounds in his cartridge-box.

IV. This drill call is liable to come to any command at any time between the 10th of July and the 10th of August. As it is intended to show the utility of the squad organization in an emergency, no alarm on fire or church bells will be allowed. The uniform will be "fatigue" and the call for the drill will be at an hour least likely to embarrass men in their business affairs.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, July 2, 1891.

GENERAL ORDERS,
No. 17.

I. The Commander-in-Chief having been advised of the Senate's action in adopting a resolution disapproving General Order No. 6, A.-G. O., series of 1890, and, so far as it had power, reinstating Charles P. Graham as Brigadier-General, honorably discharged by said order; and the Commander-in-Chief, disagreeing with the Senate in its construction of, and its powers under the law; yet for the purposes of this order recognizing the fact that the Senate has taken such action, does, by virtue of the powers vested in him by the Constitution and laws of this State, hereby discharge said Charles P. Graham from the military service of the State for the benefit of the service.

II. Thomas L. Watson of Bridgeport, Conn., late Colonel commanding Fourth Regiment, Connecticut National Guard, is hereby appointed to the command of the Brigade, Connecticut National Guard, with rank from March 1, 1890. He will be obeyed and respected accordingly.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, July 3, 1891.

GENERAL ORDERS,
No. 18.

I. In accordance with the Militia Law of the State, the Brigade Connecticut National Guard will assemble at the State camp-ground, Niantic, Conn., on Saturday August 15th, 1891, not later than 3 o'clock P. M., for an eight days' tour of duty and instruction under the immediate orders of the

Brigade Commander, Brigadier-General Thomas L. Watson, who is hereby directed to make requisition on the Quartermaster-General of the State for necessary transportation, equipage and supplies, to issue orders governing the movements of troops and details of camp, and other duty during the eight days' encampment. He is also instructed to call the attention of officers and enlisted men of his command to the laws of the State relating to encampments of the Connecticut National Guard, penalties for absence, unsoldierly conduct, disobedience of orders, etc., and to punish to the extent of the law, any and all offenders.

He will be required to make to these Headquarters, the usual "Consolidated Daily Reports," and at the end of the tour of duty, the "Consolidated Morning Reports" of each organization for every day of the encampment.

II. The Quartermaster-General will arrange the camp-ground and pitch the tents, including quarters for the Commander-in-Chief and his Staff. He will also, upon approved requisition to be made by the commanding officers of organizations on or before July 20th, furnish transportation to and from the camp-ground. Transportation for baggage beyond that carried by the men in knapsacks, will be limited to two company chests for each company, or one for each platoon, and one valise or small trunk for each officer, *and Regimental Quartermasters will be held responsible for a strict compliance with this requirement.*

Issue will be made in camp by the Quartermaster-General to commanders of organizations, of the usual camp supplies for company and platoon use.

III. Commanding officers of organizations in the Third Regiment will make requisition for an entire outfit of new blankets, and all company commanders throughout the Brigade who have not already done so will make requisitions for new drums, forwarding the same with their requisitions for transportation under this order.

IV. Muster pay-rolls made *strictly* in accord with instructions thereon, signed and completed according to law, must be delivered at these Headquarters by 10 o'clock A. M. on Saturday, August 22d.

Men enlisted between June 1st and July 1st may be carried on the muster pay-rolls for duty in camp, provided commanding officers certify that such men have had instruction in the armory at least two evenings each week since enlistment. Enlistment papers must be received at these Headquarters *at latest* with the "Gain and Loss" report for month of July, or recruits will not be considered eligible for camp duty.

V. The Governor will review the Brigade on Friday, August 21st.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, July 23, 1891.

GENERAL ORDERS,
No. 19.

I. The grounds owned by the State in the Town of East Lyme, and occupied for the annual encampment of the Connecticut National Guard, are hereby officially designated "State Military Rendezvous," Niantic, Conn.

The encampment of the C. N. G., beginning August 15, 1891, is hereby named "Camp Watson," in honor of Brigadier-General Thomas L. Watson, commanding Brigade C. N. G. The full official designation of the next ensuing annual encampment will therefore be

Camp Watson,
State Military Rendezvous,
Niantic, Conn.

II. Whenever the Adjutant-General shall be officially informed, through the Brigadier-General commanding, that the Regimental Field and Staff officers of his command are all equipped with the U. S. regulation sabre, Par. 2112, Article XXX, Regulations C. N. G., will be so amended in General Orders from this office, as to specify that side-arm as the one to be worn by the officers designated.

III. Par. 2150, Article XXX, Regulations C. N. G., is hereby amended to authorize and require the following badge to be worn upon the forage-cap of enlisted men, to wit: for Artillery, crossed cannon; for Infantry, crossed rifles; with the number of the Platoon or Regiment in the upper, and the letter of the Battery or Company in the lower angle of the badge, as specified in Regulations, U. S. A.

IV. On requisition approved by the Brigadier-General commanding, the Quartermaster-General will provide a suitable Chapel tent, giving the same a central location in the lay-out of the Camp, in which religious services can be held under such regulation as the Brigadier-General commanding may prescribe.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,
Hartford, August 13, 1891.

GENERAL ORDERS,
No. 20.

I. Changes as follows in the commissioned officers of the CONNECTICUT NATIONAL GUARD have occurred since June 27, 1891:

RESIGNED AND DISCHARGED.

FIRST REGIMENT.

Captain Fredric C. Wilson, Adjutant, July 18, 1891.

FOURTH REGIMENT.

Captain William F. Daniel, Company C, July 7, 1891.

First Lieutenant Edward S. Walsh, Company C, July 27, 1891.

APPOINTMENT REVOKED AND DISCHARGED.

FOURTH REGIMENT.

First Lieutenant George A. Smith, Company F, July 15, 1891.

PROMOTED AND APPOINTED.

FIRST REGIMENT.

First Lieutenant Charles H. Patterson, of Hartford, appointed Captain Company H, with rank from June 29, 1891, *vice* McLean, dismissed.

First Sergeant William Blevins, Company A, of Hartford, appointed First Lieutenant Company H, with rank from July 1, 1891, *vice* Patterson, promoted.

Commissary Sergeant John F. Lehr, of Hartford, appointed Second Lieutenant Company H, with rank from July 1, 1891, *vice* Patterson, promoted.

First Lieutenant Charles H. Moore, of New Britain, appointed Captain Company I, with rank from June 23, 1891, *vice* Burr, appointed Judge Advocate.

Second Lieutenant Joseph R. Andrews, of New Britain, appointed First Lieutenant of Company I, with rank from June 23, 1891, *vice* Moore, promoted.

First Sergeant Theodore A. Stanley, of New Britain, appointed Second Lieutenant Company I, with rank from June 23, 1891, *vice* Andrews, promoted.

SECOND REGIMENT.

First Lieutenant William E. Moses, of Waterbury, appointed Captain Company A, with rank from June 22, 1891, *vice* Stocking, resigned.

Second Lieutenant Charles W Burpee, of Waterbury, appointed First Lieutenant Company A, with rank from June 22, 1891, *vice* Moses, promoted.

Sergeant Edwin Hart, of Waterbury, appointed Second Lieutenant Company A, with rank from June 22, 1891, *vice* Burpee, promoted.

George E. Albee, of New Haven, appointed Captain Company D, with rank from June 23, 1891, *vice* Shuster, resigned.

First Lieutenant Frederick L. Lehr, of New Haven, appointed Captain Company E, with rank from June 23, 1891, *vice* Sucher, resigned.

Second Lieutenant Henry S. Hamilton, of New Haven, appointed First Lieutenant Company E, with rank from June 23, 1891, *vice* Lehr, promoted.

Sergeant William H. Coleman, of New Haven, appointed Second Lieutenant Company E, with rank from June 23, 1891, *vice* Hamilton, promoted.

First Sergeant Charles F. McCabe, of New Haven, appointed Second Lieutenant Company F, with rank from June 29, 1891, *vice* Macdonald, resigned.

First Sergeant Daniel L. Barber, of Wallingford, appointed Second Lieutenant Company K, with rank from June 25, 1891, *vice* Norton, resigned.

THIRD REGIMENT.

Captain Hezekiah B. Smith, Adjutant, of New London, appointed Lieutenant-Colonel, with rank from June 30, 1891, *vice* Twomey, resigned.

O. Chester Sharpe, of Killingly, appointed First Lieutenant Company F, with rank from June 12, 1891, *vice* Darbie, resigned.

FOURTH REGIMENT.

Private Joseph D. Goulden, Company C, of Stamford, appointed Inspector of Rifle Practice, with rank of Captain from July 6, 1891, *vice* Finn, promoted.

Second Lieutenant Charles W. Hendrie, of Stamford, appointed Captain Company C, with rank from July 20, 1891, *vice* Daniel, resigned.

Corporal Francis E. Alden, of Stamford, appointed Second-Lieutenant Company C, with rank from July 20, 1891, *vice* Hendrie, promoted.

Sergeant George A. Smith, of Norwalk, appointed First Lieutenant Company F, with rank from June 12, 1891, *vice* Matheis, dismissed.

II. Private Harry O'Brine, Co. A, Third Regiment, Connecticut National Guard, has been discharged for the benefit of the service from the military service of the State, in accordance with sentence of Field Officer's Court-Martial.

III. The following-named members of the Connecticut National Guard have been dishonorably discharged from the military service of the State, in accordance with sentences of Field Officers' Courts-Martial, viz. :

SECOND REGIMENT.

Company I, Private Charles Martin, Jr.

THIRD REGIMENT.

Company A, Private John J. Gannon.
Private John H. Gleason, Jr.
Company C, Private James W. Stott.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,
Hartford, September 10, 1891.

GENERAL ORDERS,
No. 21.

I. The State Rifle Match for Regimental Teams of the Connecticut National Guard, inaugurated by G. O. No. 21, A. G. O., Series of 1888, continued under G. O. No. 19, A. G. O., Series of 1889, and suspended for that season, in G. O. No. 23, A. G. O., Series of 1890, will this year occur at time and place to be designated by Brigadier-General Thomas L. Watson, commanding Brigade C. N. G., who will detail from his Staff such Officers to conduct the match as his judgment deems necessary, and arrange the details for the guidance of contestants, covering conditions of match, size of teams, etc., etc. Necessary traveling and hotel expenses only will be allowed such Staff Officers as may be detailed.

II. The Quartermaster-General will issue, upon approved requisition, to the commanding officer of each organization entering a team, 1,500 rounds ball cartridge, cal. 45, 70-500, and to the Staff Officer to be designated by the Brigade Commander, such targets, patches, and pay for necessary official scorers and markers as may be required.

III. The Brigade Commander will make report of the match, in detail, to the Commander-in-Chief.

IV. The 1st prize, a Silver Cup, was won in 1888 by the 1st Regt. team, and in 1889 by the 2d Regt. team. The 2d prize, a Bronze Medallion Bust of General U. S. Grant, was won in 1888 by the 2d Regt. team, and in 1889 by the 1st Regt. team. A third trophy, a Bronze Statuette of a Roman Soldier, was added in 1889 and won by the 3d Regt. team.

As provided in Par. I., G. O. No. 21, A. G. O., 1888, a suitable medal will be awarded by the State to each member of the team winning the first prize.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, September 18, 1891.

GENERAL ORDERS,
No. 22.

I. The following persons are hereby appointed Post-Surgeons, to determine exemptions from military duty by the standard of disability prescribed by the Surgeon-General.

Hartford County—William W. Knight, Hartford; George Clary, New Britain; Edward F. Parsons, Enfield; I. P. Fiske, Southington; Henry C. Bunce, Glastonbury; George F. Lewis, Canton; Chas. M. Wooster, Tariffville; Noah W. Holcomb, Simsbury; Hervey E. Way, Bristol; Charles Carrington, Farmington; S. R. Burnap, Windsor Locks; Julian N. Parker, Manchester; Edward G. Fox, Wethersfield; E. J. McKnight, East Hartford.

New Haven County—C. Purdy Lindsley, New Haven; Alfred North, Waterbury; N. Nickerson, Meriden; George L. Beardsley, Derby; E. B. Heady, Milford; G. P. Reynolds, Guilford; J. D. McGaughey, Wallingford; Walter H. Zink, Branford; W. C. Williams, Cheshire; Franklin B. Tuttle, Naugatuck.

Middlesex County — Francis D. Edgerton, Middletown ; John H. Grannis, Old Saybrook ; Miner C. Hazen, Haddam ; M. W. Plumsted, East Haddam ; Charles H. Hubbard, Essex ; Edwin Bidwell, Deep River ; Herbert S. Reynolds, Clinton.

New London County — Francis N. Braman, New London ; Leonard B. Almy, Norwich ; Frank A. Coates, Stonington ; Seth L. Chase, Colchester ; George W. Harris, Old Lyme ; William Soule, Griswold ; Edwin H. Knowles, North Stonington.

Windham County — William A. Lewis, Plainfield ; John B. Kent, Putnam ; Theodore R. Parker, Windham ; Rienzi Robinson, Killingly ; Lowell Holbrook, Thompson ; Henry L. Hammond, Dayville.

Tolland County — S. G. Risley, Vernon ; C. B. Newton, Stafford ; Henry S. Dean, Coventry ; Frederick E. Johnson Mansfield.

Fairfield County — Charles C. Godfrey, Bridgeport ; Wm. C. Burke, Jr., Norwalk ; Abraham T. Clason, Danbury ; Charles R. Hart, Bethel ; Charles E. Rowell, Stamford ; Edwards M. Smith, Newtown ; William L. Griswold, Greenwich ; William S. Todd, Ridgefield ; William G. Brownson, New Canaan ; Loren T. Day, Westport ; William H. Donaldson, Fairfield ; Moses H. Wakeman, Redding ; Andrew B. Gorman, Wilton ; William F. French, Darien.

Litchfield County—C. O. Belden, Litchfield ; William Bissell, Salisbury; J. C. Barker, New Milford ; Edward H. Welch, Winchester ; Leander Y. Ketcham, Woodbury ; Edward Sanford, Cornwall ; William Woodruff, Thomaston ; William L. Platt, Torrington ; Eugene C. French, Watertown ; Orlando Brown, Washington.

II. All persons between the ages of 18 and 45 years, desiring exemption from military duty and commutation tax, by reason of mental or physical disability, must report to one of the Post-Surgeons for examination, and if found exempt will be furnished with a Certificate of Exemption, to be filed by them with the Selectmen of the Town in which they are liable to enrollment. Those who were exempted by Post-Surgeons in any year since 1878, *and the disability classed as permanent*, and who are now living in the same town, will not be required to be examined again, unless by order of the Surgeon-General Persons who neglect to file their Certificate of Exemption with the Selectmen *before the first day of December next* will be debarred from exemption for the year.

III. Post-Surgeons will make exemptions strictly in accordance with the orders of the Surgeon-General, and on the *1st of December next* will report to him, on blank form as provided, the names of all exempted by them, giving town and disability, and the names of all examined and not exempted. The fee for examination will be paid on approval of this office upon the report made to the Surgeon-General.

Blanks for Certificates of Exemption and Reports to Surgeon-General will be supplied to Post-Surgeons from this office.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, September 23, 1891.

GENERAL ORDERS,
No. 23.

I. The Court of Inquiry convened by S. O. No. 84, c. s., "to examine into the efficiency of the administration of Company affairs by Captain John F. Lawler commanding Company B, First Regiment C. N. G., and to report such changes or recommendations as they may deem necessary to secure harmonious action and a good degree of discipline in said company," having performed the duty assigned it and rendered its report, is hereby dissolved.

II. Following is the material part of the finding of the Court as set forth in its official report. "The parties in interest having been fully heard, with their witnesses and their counsel, and the Court having maturely considered the evidence adduced, respectfully recommends that the resignations of First Lieutenant Richard J. Kingsley and Second Lieutenant John J. O'Neil, which they have voluntarily tendered, be accepted, and they be honorably discharged from the military service of the State."

III. The foregoing recommendation of the Court is hereby approved, except in so far as it relates to the acceptance of the resignations of the officers designated. Said resignations having been returned by the Regimental Commander to the officers tendering them, they are no longer in the control of the Regimental Commander or of this office.

IV. First Lieutenant Richard J. Kingsley and Second Lieutenant John J. O'Neil, of Company B, First Regiment C. N. G., are hereby honorably discharged from the military service of the State.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT,

ADJUTANT-GENERAL'S OFFICE,

Hartford, September 29, 1891.

GENERAL ORDERS, }
No. 24. }

The official report of First Lieutenant William H. C. Bowen, Fifth United States Infantry, covering his inspection of the Connecticut National Guard during its entire tour of duty at Camp Watson, August 15th to 22d, 1891, inclusive, is published in full herewith for the instruction of the C. N. G.

The regular army officer responsible for this report is one thoroughly competent to accord praise or censure as deserved upon any body of National Guardsmen under arms. He observed the work of the Brigade minutely during the entire period of the encampment, and his very favorable report is, therefore, a just source of pride to the National Guard and to the State.

It is not, however, his words of praise and commendation which induce the publication of this report in General Orders to the C. N. G. The purpose is to call attention to the points adversely criticised in the report, to the end that special effort may be given to improvement in the directions indicated.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

REPORT OF INSPECTION OF THE NATIONAL GUARD OF CONNECTICUT.

NEW HAVEN, CONN., August 29, 1891.

The INSPECTOR-GENERAL U. S. ARMY,
Washington, D. C.

SIR: — I have the honor to report that in compliance with letter of instruction from the Ajdutant-General's Office, dated June 8, 1891, supplemented by instructions from your office of June 15, 1891, I visited the encampment of the Connecticut National Guard at Niantic, Conn., August 15–22, 1891 (both dates inclusive).

I arrived at Niantic in company with the adjutant-general of the State, Brigadier-General A. H. Embler, at 11:02 on the morning of the 15th. We were met by Colonel Morgan, assistant quartermaster-general, who drove us to camp, distant from the station about three-quarters of a mile.

The camp, called Camp Watson in honor of the brigade commander, is situated on a plain by the Niantic River, swept by the cool breezes from Long Island Sound, and admirably adapted to the purposes for which it is used.

The tents were already pitched, each with a good floor, and with three mattresses for each tent to be occupied by the men; the three mattresses completely covered the floor and made a good resting place for four men. The length of the color line was fully one-third of a mile.

Together with General Embler, I paid my respects to the commanding officer, Brigadier-General Thomas L. Watson, and reported my arrival. A wall tent, furnished throughout, had been provided for me with the governor's staff, with whom I was invited to mess. From his excellency Governor Morgan G. Bulkeley down to the private soldier I received a most cordial welcome, and I herewith extend to them all my most hearty thanks. Better men for their positions than General Embler as adjutant-general and General Watson, brigade commander, could not be picked out. When I say that both of them are *soldiers* I pay them the highest praise.

Battery A had already arrived in camp when I reported, but I was in time to see the different regiments come in.

The Third Regiment, Colonel George Haven, was the first to arrive, marching into camp at 12:55.

The First Separate Company (colored), Captain Lathrop, followed at 1:20.

Next came the Second Regiment, Colonel John B. Doherty, with 691 men out of a total of 722, a remarkable showing. They came at 1:30, followed by the Fourth, Colonel Henry Skinner, at 2:53.

The Second Separate Company (colored), Captain Freeman, marched in at 3:15, followed by the First Regiment, Colonel Charles B. Erichson, at 3:20. Total per cent. of whole brigade present, 93.96.

The Third Regiment wore overcoats coming into camp, as the weather was threatening; otherwise in full marching order with leggings. The other troops all in full marching order, overcoats strapped to knapsacks, and all wearing leggings.

I wish to call especial attention to the following: The Third Regiment, Colonel Haven, arrived at 12:55; at 2:30 the whole regiment, with the exception of those for guard, were out at battalion drill.

Full-dress guard mounting took place at 3:30, each regiment mounting its own guard.

ORGANIZATION.

The governor is the commander-in-chief, with a staff as follows: —

With rank of brigadier-general: Adjutant-general, quartermaster-general, surgeon-general, commissary-general, and paymaster-general.

With rank of colonel: Assistant adjutant-general and assistant quartermaster-general, who are salaried officers; and four aides-de-camp.

The Connecticut National Guard consists of thirty-eight companies of infantry, four machine-gun platoons, and one battery of artillery. The companies of infantry are organized into four regiments, the First and Second of ten companies each, and the Third and Fourth of eight companies each. Besides the regiments there are two separate companies of colored troops, officered by colored men. There is no cavalry. To each regiment are attached a machine-gun platoon (Gatling), averaging 1 officer and 7 men each; a hospital corps of 2 officers and 5 men; a band of 20 men; and a signal corps of 1 officer and 9 men.

The troops are organized into a brigade commanded by a brigadier-general, having a staff consisting of an assistant adjutant-general with rank of lieutenant-colonel, a brigade inspector, quartermaster, commissary, inspector of rifle practice, and engineer and signal officer, all with the rank of major; a medical director with rank of lieutenant-colonel, and two aides-de-camp with rank of captain. The medical director must be a graduate of a lawfully established medical college, and must have been in practice at least 5 years. The engineer and signal officer must be a civil engineer of at least 3 years' standing.

The brigade non-commissioned staff is composed of one chief trumpeter and two brigade orderlies. All rank as sergeants and all mounted, one carrying brigade color.

Each regiment is officered as follows: A colonel, lieutenant-colonel, and major, an adjutant with rank of captain, a quartermaster and paymaster, each with rank of first lieutenant, a surgeon with rank of major, and an assistant surgeon with rank of first lieutenant, an inspector of rifle practice with rank of captain, a signal officer with rank of first lieutenant, and a chaplain without rank, but entitled to pay of adjutant.

The non-commissioned staff consists of a sergeant major, a quartermaster sergeant, a commissary sergeant, a hospital steward, a chief trumpeter, and a drum major, all appointed and warranted by the colonel.

All surgeons and assistant surgeons must be graduates of a lawfully established medical college, and all hospital stewards must be licensed by the State commissioners of pharmacy.

Each company is composed of a captain, a first and second lieutenant, a first sergeant, a quartermaster sergeant, 4 sergeants, 8 corporals, 1 trumpeter, and 2 musicians, and not more than 64 nor less than 32 privates. (Each company averages a total of 64 officers and men.)

Each machine-gun platoon consists of 1 second lieutenant mounted and such number of non-commissioned officers and privates as may from time to time be designated by the commander-in-chief, averaging at the encampment 1 officer and 7 men.

The battery of artillery consists of a captain, 2 first and 2 second lieutenants, 1 first sergeant, 1 quartermaster sergeant, 1 veterinary sergeant, 4 sergeants, 8 corporals, 2 trumpeters, 1 guidon, and not more than 64 nor less than 32 privates. The battery is divided into two platoons, each commanded by a first lieutenant. (Total number of officers and men at camp, 74.)

PAY AND ALLOWANCES.

For each day's service in complete uniform at parades and encampments authorized, shall be paid to each officer, musician, and private, $2 per day; to the drum and fife major and members of the band, $2.75 per day. Each mounted officer in addition is paid $5 per day for use of horse; for each artillery horse, $2 per day.

Rations and forage, or commutation thereof, as prescribed by the U. S. Army Regulations.

In addition to above each commander, company commander, and commander of each platoon of artillery, $50 per year, and the commander of each machine-gun platoon, $25 per year.

All officers ordered to special duty by the commander-in-chief receive such pay as may be designated by him.

Each officer or soldier wounded or disabled, and the widow and children of each officer or soldier killed while in the service of the State, shall be suitably provided for by the General Assembly.

CLOTHING.

Suitable clothing after the pattern of the U. S. Army is furnished to each enlisted man by the State. Each officer furnishes his own, and is allowed $10 per year for care of same. The clothing of the men is old and worn and needs to be replaced.

EQUIPMENTS.

One regiment of infantry is armed with the Springfield rifle, caliber .45; the rest of the infantry with the Peabody same caliber. As the company which manufactured the latter has gone out of business small parts cannot be secured ; therefore if any part breaks it cannot be replaced, consequently the arm is not a desirable one. The State intends, so I am informed, to re-arm the brigade with the arm to be adopted by the War Department. This applies as well to the artillery (which now has a battery of 3-inch Rodman guns) as to the infantry.

Haversacks, canteens, and knapsacks are furnished by the State. Each organization furnishes its own leggings. The old pattern McKeever cartridge-box is used. The State has no web belts for field service.

EQUIPAGE.

The State owns sufficient serviceable equipage to fully equip the brigade. It consists of hospital tents and flies for field hospital, and officers' wall tents and flies for officers, and walled common tents for enlisted men, four men to each tent.

MESSING.

The messing is done by caterers, each caterer having one or more companies. The ration to the men is commuted at 30 cents each, and each organization makes its own contract with the caterer. The system is bad, and there is much complaint. I would suggest that the messing be placed in charge of the commissary department.

The State has built good mess-houses for each regiment and for brigade headquarters and for the governor and staff. The kitchens at the different mess-houses are simply sheds. Something should be done to remedy this defect. (Action since camp is being taken.)

POLICE OF CAMP.

The policing of camp was first-class in every particular. Tents, company streets, kitchens, sinks, etc., were inspected each day by some one of the brigade officers in addition to the inspection of regimental and company officers. Sinks were kept sweet and clean, all slops were removed twice a day, and police parties were about from time to time during each day and evening to remove any rubbish which might have been carelessly thrown on the parade or about the different headquarters.

HOSPITALS.

The hospital was situated in rear of brigade headquarters, distance about 100 yards, and in charge of Lieutenant Colonel George L. Porter, who, some twenty years ago, resigned from the regular service.

There were four ambulances, two of which were kept hitched up all the time, ready for any emergency. The drill of the hospital corps of the Third Regiment, under the immediate charge of Regimental Surgeon Major Leonard B. Almy, was something to be proud of. Major Almy has adopted a system which, to my mind, cannot be improved upon. The different regimental surgeons, with their assistants, were detailed in rotation for hospital duty, and together with the hospital corps did good service. The whole corps should receive praise.

There was little sickness in camp, the average number per day being but 5.

Everything pertaining to the medical and hospital corps of the brigade should be marked "perfect."

MACHINE-GUN PLATOONS.

The four machine-guns were formed into a battery, and drilled as such. Too much praise cannot be accorded this corps for the efficient manner in which its duty was performed. For two days I was with the troops performing outpost duty ; on each day a different gun went out with the attacking force, and to see the way in which advantage was taken of every shelter, the manner in which the gun was taken by hand over ground impossible for horses, and the manner in which the whole work was performed would have led a stranger to believe that disciplined "veterans" were doing the work.

SIGNAL CORPS.

Each regiment has a signal corps attached to it, of 1 officer and 9 men.

The flag and torch service was well performed, but the First Regiment deserves honorable mention on account of its special bicycle service. Under its commanding officer, First Lieutenant Howard A. Giddings, this corps of wheelmen has reached a high degree of proficiency. Major Charles L. Burdett, brigade engineer and signal officer, was the originator of this plan, and to his energy and perseverance the corps is indebted for its excellence. The men were armed with the Colt's repeating carbine and with the revolver. A man mounted on a bicycle can go many places where it would be impossible to take a horse, and it can beat the "flag" in sending messages in nearly every case. As a fighting force it may not be favored, but as messengers, patrols, and advance guard, in my opinion, it would be invaluable. I would recommend to the serious consideration of the War Department the advisability of experimenting with the bicycle.

Speaking of the utility of the wheel in actual warfare, General Wolseley is reported to have said, "There are few countries in the world where you cannot use 'cycles. * * * I do not remember one day's march or any one fight in which we took part where 'cyclists could not have been used with the greatest possible advantage."

The principal duties of the military 'cyclist are those of carrying dispatches, skirmishing, and reconnoitering. As applied to the Signal Service, the wheels, in my opinion, would almost double its usefulness.

The signal corps, under direct charge of Lieutenant Giddings, put up a complete telephone system in camp, which was most convenient, each regiment being connected with headquarters, the hospital, the quartermaster's department, and the stables.

One of the companies of the Second Regiment from Waterbury, G, took into camp a cage of carrier pigeons. Several were liberated each day, and with messages attached to their legs made the trip of about 63 miles in a trifle over an hour.

LIGHT ARTILLERY.

There is but one battery, A, in the State, officered by a captain and 4 lieutenants, and having 69 enlisted men. The guns are four 3-inch Rodmans. Equipments are poor, but notwithstanding the fact that the horses are taken from the farm and are hitched up but seven days in the year for this kind of work, the degree of proficiency obtained is remarkable. Captain Fowler and his battery deserve great credit for the excellent drill and discipline attained.

HEAVY ARTILLERY.

The earthworks at camp are armed with two 10 inch Rodmans and four 10-inch mortars. Sergeant Cashman, Second Artillery, stationed at Fort Adams, was detailed as instructor in heavy-gun and mortar practice, and performed his duties well. Plaster shells were used with small charges of powder, and the drill and instruction were most satisfactory.

MILITARY DUTY.

Military duty was well done. At roll-calls the command "Fall in" by first sergeants was, as a rule, a little slow, but that was the fault of the individual ; few enlisted men were absent from calls. The calls were sounded promptly by the chief trumpeter at brigade headquarters, and promptly repeated by the regimental and company musicians. Formations for drills were fairly prompt, and for parades could not be improved upon. When I say that at one parade the different regiments were formed and presented to their colonels within 78 seconds from the first note of the band, the degree of promptness attained may be realized. Guard mounts and parades throughout the week were prompt and went smoothly, showing that much attention had been paid to these ceremonies during the drill season. Guard duty was fairly well done; men generally were fairly well posted and knew their duties.

The whole of each day except Sunday was devoted to military duties, and there was no shirking. Each man, except the sick, the guard, and some few specially excused, was required to attend all roll-calls and all drills. Reveille sounded at 6 A. M., and from that time till the dismissal of brigade dress parade, at about 6.10 P. M., every officer and man in camp was at work.

DRILLS.

The infantry were drilled each day in company and battalion skirmish drill, and in the school of the battalion; also in outpost duty. The country about Niantic is well adapted for this latter duty, and officers and men took much interest in it. The colored troops particularly should be mentioned as they make such splendid skirmishers and scouts.

Outpost duty may be said to be a fad with Major Burdett, engineer and signal officer, and he gives much time and study to this branch of military duty.

TARGET PRACTICE.

There was no target practice during camp week. All target firing is done by the different organizations during the spring and summer months. In this State there is no skirmish target practice, which I think is to be regretted.

INSPECTIONS.

Each organization was inspected every morning at 8, also the mess-houses, sinks, company streets, etc. This inspection of the company tents, streets, etc., was a revelation. Mattresses and blankets were nicely piled and folded, with clothing, helmets, etc., neatly laid on top; arms in racks; shoes, etc., polished and placed at back of tent, toes to front. Too much credit cannot be given to the companies for the neatness and the dressing of the tents, and the cleanliness of the company streets. Within 4 hours of breaking camp one of the regiments had a mark of 100 per cent. at this inspection, which mark was nothing unusual during the week throughout the brigade, but deserves special mention, reference being had to the time. The companies under arms were not inspected man by man and piece by piece, which I think is to be regretted.

The governor was in camp from Monday at 5 p. m. till Saturday at 7 a. m. He made frequent personal inspections of tents, sentinels, buildings, etc., and took great interest in the encampment. He also took frequent rides about the country, accompanied by his staff (to which I had the honor to be temporarily attached), and inspected the working of the outposts. He is a hard worker and a great believer in the Connecticut National Guard, and it is owing to his judgment and firmness that the brigade has such an excellent commander, and that it was in camp 8 days instead of 6, as was usual.

The review on Friday, "Governor's Day," was something to be remembered. Twenty-five hundred disciplined men in line were a magnificent sight; the "march past" was steady, lines well dressed, and intervals fairly well preserved. When guides are a little better instructed the distances will be better taken.

QUARTERMASTER'S DEPARTMENT.

I cannot close this report without giving a few words of commendation to this most excellently managed department. Under its chief, Brigadier-General William B. Rudd, ably assisted by Colonel Henry C. Morgan (a retired Army officer), the State of Connecticut has a department to be relied on. It is well organized, well supplied, and well manned. To go into details would take up too much space; I therefore leave it with the few remarks already made.

GENERAL REMARKS.

General Watson has acquitted himself to the satisfaction of the brigade throughout. He has deservedly won the esteem, respect, and regard of every man in the brigade, from "high private" up. The officers to a man are loyal to him, and it is no false praise to say he is in command of the finest brigade encampment the Connecticut National Guard ever held.

It would be neither fair nor just in the light of the excellence of the encampment to pass severe words of censure upon the minor details that are unquestionably open to criticism, for nothing else that I have seen can be found fault with. The brigade as a whole is thoroughly proficient and the faults which are apparent are of such a nature that they cannot be criticized, from the fact that with a little more training of the men, which I believe they honestly desire, instruction will overcome the chief obstacles of objection that have arisen, and do away with all the criticisms that would arise.

Too little attention is paid in the matter of salutes. There is not enough respect shown for the officers. When men don a uniform their *individuality* becomes extinct and they should forget familiarity and honor the *offices* if they do not honor the men who occupy them. The militiamen are *ready* and *willing* to learn, and all they need is instruction in this respect. The fault lies with the officers and non-commissioned officers, who as a rule overlook this matter and are careless.

The non-commissioned officers are not strong and forcible enough. If they would exact more respect it would be gladly given, for, I repeat, the men are anxious and willing to obey orders and to pay respect, only they do not know how and need teaching.

The guard mounts at camp have been all that could be desired. They have been executed with snap and vim. Especially noteworthy was the guard mount of Saturday morning, when it was performed as faithfully as at any time during the week, and that on the eve of breaking camp. I have no hesitancy in saying that there is material enough in the National Guard of the State to make veterans in 30 days if put to the test.

The brigade staff is composed of hard and intelligent workers, while the same is true of the leaders of the governor's staff. The colored troops are simply perfect, and in getting through the brush, as demonstrated on grand guard, they exhibit the traits of Indians, and in scouting exhibit an acuteness that is absolutely marvelous. The camp was simply perfect, and I have no hesitancy in saying that if the exigency arose to-morrow the Connecticut National Guard could turn out at a moment's notice enough men equipped, and with military knowledge to act as line officers for a whole brigade. The camp has been a great success, and I say unhesitatingly that it is one of the finest brigades in the United States.

One innovation deserves mention, and that is the presence in camp of representatives of the Young Men's Christian Association. They provided a large round tent, well equipped with free tables, chairs, benches, lights, newspapers, shoe-brushes and blacking, pens, ink, paper, etc. The tent was well patronized during the week and served its purpose well.

On the only Sunday in camp there were present each regimental chaplain, and also, for those of the faith, a Roman Catholic priest. Services were ordered to be held, and were held, at 8 and 10 a.m., and at 8 p.m., and all were well attended. In addition there were two services in the afternoon not ordered. A prominent clergyman who was present in camp said that he wished every one in the State could know of the details of the Sunday observance. He said that he was surprised and delighted at the conduct of the men, not only on Sunday but during the week. When the order for the 8 days' encampment was first issued he had fears that Sunday would be a day of idleness and drunkenness, but instead, the good order, the well-attended meetings, the quiet and reverence shown, were something he wanted to remember and something he wished to thank the men for, and which he wished to tell the people of, that in future no objection would be made by religious people to an 8 days' encampment.

I beg leave in closing to again express my appreciation of the many acts of courtesy received at the hands of the governor and his staff, the brigadier-general and his staff, and from the different regimental and company commanders.

WM. H. C. BOWEN,
First Lieutenant, Fifth Infantry.

STATE OF CONNECTICUT,

ADJUTANT-GENERAL'S OFFICE,

Hartford, October 9, 1891.

GENERAL ORDERS,
No. 25.

I. With sorrow the Commander-in-Chief announces the death of Brigadier-General Frederick E. Camp, at his home in Middletown, Conn., at an early hour yesterday morning.

General Camp's military record in the service of the State and Country is honorable and notable.

He served as Lieutenant in the Twenty-fourth Regiment C. V. in 1862; as Captain and Major in the Twenty-ninth Regiment C. V. in 1864; as Lieutenant-Colonel in the Twenty-ninth Regiment U. S. C. T. in 1865; as Lieutenant in the Fourteenth and Thirty-second Regiments U. S. Infantry in 1866; and as Captain in the Second Regiment U. S. Infantry in 1871, resigning in 1875.

Locating in Middletown, he accepted the Captaincy of Company H, Second Regiment, C. N. G., in 1876, and resigned in 1880; was Captain and Adjutant of the Second Regiment, C. N. G., 1880–1; Paymaster General on the staff of Governor Bigelow, 1881–2; and Adjutant-General on the staff of Governor Lounsbury, 1887–8. He was active in Grand Army work; a member of Mansfield Post. Member and Treasurer of the Soldiers' Hospital Board. By his death the Veteran Soldiers and the National Guardsmen of Connecticut suffer the loss of an earnest friend, whose best efforts were ever at their command.

II. As a mark of respect to his memory, officers and ex-officers of the Connecticut National Guard are requested to attend his funeral, in civilian's dress, at Middletown on Monday the 12th instant, assembling at the McDonough House at 1.15 o'clock P. M.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, October 10, 1891.

GENERAL ORDERS,
No. 26.

I. The Committee on Ceremonies of the World's Columbian Exhibition, having called a convention of officers of the National Guard, to canvass the military features contemplated at the dedication ceremonies, to begin October 11, 1892, and to consider the subject of a grand encampment of the National Guard, to be held during the summer of 1893 ; and it being desirable that Connecticut should be represented at that Convention, the Commander-in-Chief hereby appoints Brig.-General Andrew H. Embler, Adjutant-General, delegate, and Brig.-General Thomas L. Watson, commanding Brigade, C. N. G., alternate, to perform the duty required, and report the result of the deliberations of the Convention.

II. Necessary traveling and hotel expenses will be allowed to the delegate or alternate performing the duty.

III. General Order No. 22, c. s., this office, was not mailed to commanding officers of the National Guard, for the reason that it pertains only to the appointments of post-surgeons for the ensuing year.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, October 17, 1891.

GENERAL ORDERS,
No. 27.

I. In accord with the Militia Law of the State, the drill season of the Connecticut National Guard will begin Monday, November 2d, 1891, and continue until Wednesday, June 1st, 1892.

Brigadier-General Thomas L. Watson commanding the Brigade, will at once issue orders for weekly evening drills of each Company, Signal and Hospital Corps, Artillery and Machine-Gun Platoon in his command, specifying the course of instruction, and such details for the carrying out of same as may in his judgment best advance his command in drill and discipline. If he deems that proficiency may be attained in any organization other than Infantry companies, by fortnightly drills, he may so order.

II. The Commander-in-Chief directs that the Brigade Commander shall require special attention given to *guard duty.* The Manual (Kennon) has been in the hands of officers long enough for them to be perfectly familiar with all its details. No excuse can be offered for ignorance in this important feature of the work required of the Brigade. *Skirmish drill* by the bugle will also be made a prominent feature of the drill season. The work done in this direction during the last drill months was noticeable at the recent encampment. At "Camp Embler" 1890, the skirmish drill of companies by the bugle was the exception, but one or two of the thirty-eight infantry companies attempting it. At "Camp Watson" in 1891, this drill by bugle was the rule, but two or three of the Infantry companies not practicing it.

The yearly criticism upon the lack of military courtesy, is, in view of the other good work performed by all the organizations, a matter that should ever be in the minds of officers and men. Slight effort will correct the evil.

As was suggested in Circular No. 1, A. G. O., dated August 8, 1891, relating to riot drills and calls, commanders of Regiments will find the assembling of their commands by emergency calls, both by individual notification and general alarm, of great benefit as a demonstration of how well they are in hand for immediate service. It is hoped this may not be left to General Headquarters to be put in practice. The detailing of Field and Staff Officers by Regimental Commanders, and of Brigade Staff Officers by the Brigade Commander, as prescribed in Par. 2, G. O. A. G. O., No. 22, series of 1890, will be continued during the coming season, and the portions of the paragraph relating to such details are hereby made a part of this order. The provisions of Par. 3, same order, are also continued as a part of this order.

III. The drill reports will be made as usual, in triplicate, and forwarded through regular channels with one copy of the gain and loss report, not later than the second day of the month following that reported upon. The blanks for this report will be furnished from this office upon requisition, and will call for the following data, from which will be computed the "figure of merit." 1st.—Time consumed at each drill, which must be at least 5 hours per month. 2d.—Officers and men in uniform at roll-call. 3d.—Officers and men actually drilling. 4th.—Total strength of organization. A careful verification of these reports with returns of Staff Officers will be made at Regimental, Brigade and General Headquarters. Officers making the reports will be held to a strict accountability for discrepancies if any are found to exist. Delay in forwarding, or careless compilation of these reports, that may prevent prompt issue of orders from this office, giving results of the month's work, will be deemed sufficient cause for censure of the officer responsible, in orders.

If the Brigade Commander deems it advisable to order fortnightly drills in any corps or platoons, four hours per month will be required to attain 100 per cent. of time.

IV. The Annual Muster of the Connecticut National Guard, and the Inspection of all books and records (the property is now being inspected by the Quartermaster-General), as required by law, will be made between the 5th and 25th days of November, proximo, and will be in charge of the Brigade Commander, who will detail such officers of his staff as may be required to do the work, assigning dates and localities as in his judgment seems best. Expenses incurred by Staff Officers in this tour of duty will be reimbursed as in the case of officers detailed to attend drills. No other compensation will be allowed.

Duplicate muster-rolls will be made by commanding officers of organizations before date of Muster, and the requirements of paragraph 2, G. O., A. G. O. No. 24, series of 1890, relating to muster-rolls, must be *strictly* followed.

An Inspection of the entire command with a view to report to the Commander-in-Chief its condition in drill and discipline, knowledge of officers and non-commissioned officers as to the duty required by their positions, will be made later in the drill season.

V. The Commander-in-Chief again embraces the opportunity of the issuance of the drill season order to congratulate the officers and enlisted men of the Brigade upon the work done, and high standard of excellence attained during the encampment of 1891, as evidenced by the comments of competent military authority and the universal judgment of the citizens of the Commonwealth who visited "Camp Watson." No encampment of the Brigade of Connecticut National Guard has ever equaled it in percentage of attendance, or in faithful attention to duty.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,

Hartford, November 7, 1891.

GENERAL ORDERS,
No. 28.

I. The new "Drill Regulations" for the *Army* and *Militia* of the United States are approved by the Secretary of War and now in the hands of the Public Printer. In view of the fact that the complete work may not be ready for issue for some months, and in order that the Infantry Officers and Non-Commissioned Officers of the Connecticut National Guard may become familiar with the ground work of the drill, an issue will at once be made of the extracts published by the Army and Navy Journal, embracing the "*School of the Soldier*," the "*School of the Company*," and the "*Extended order*."

II. Commandants of Infantry Companies will immediately inaugurate schools for the instruction of Officers and Non-Commissioned Officers of their commands, to the end that when the new system of drill is ordered to be taken up, Captains, Lieutenants, Sergeants, and Corporals may be competent to *instruct* the men under them. A few intelligent and reliable privates should be taken into these schools to qualify as "squad leaders," in case of need.

III. The "*Setting-up Exercises*" (par. 30) may be at once put in practice in all Companies, but the drill will not be attempted until further orders from these Headquarters.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT,

ADJUTANT-GENERAL'S OFFICE,

Hartford, November 7, 1891.

GENERAL ORDERS,
No. 29.

I. In accordance with the report of the Brigade Inspector of Rifle Practice, of the State Rifle Match for Regimental Teams of the National Guard, held at Hartford, Wednesday, October 21, *ultimo*, in pursuance of G. O. No. 21, C. S., the trophies are hereby awarded as follows : —

1st prize, Silver Cup. Third Regiment ; Score 200 yds. 300, 500 yds. 313 ; Total 613 ; p. c. 72.98.

2d prize, Bronze Medallion Bust of General U. S. Grant. First Regiment ; Score 200 yds. 298, 500 yds. 309 ; Total 607 ; p. c. 72.26.

3d prize, Bronze Statuette of a Roman Soldier. Second Regiment ; Score 200 yds. 310, 500 yds. 274 ; Total 584 ; p. c. 69.52.

II. The commanding officers of First, Second, and Third Regiments will return to the Quartermaster-General the State trophies awarded to their organizations by G. O. No. 27, 1889, and the Quartermaster-General will deliver the trophies awarded as above to the commanding officers of the regiments winning the same, who will each receive and receipt therefor and will remain the custodian thereof until further orders from this office, subject to the conditions prescribed in G. O. No. 21, 1888.

III. The members of the Third Regiment Team, to each of whom the Quartermaster-General will deliver through the regimental commandant, the State Medal awarded to members of the winning team are : —

Captain Thomas O. Thompson, Co. D ; Captain George W. Metcalf, Co. I; First Lieutenant Cornelius Bransfield, Co. B ; First Lieutenant David Connor, Co. D ; Second Lieutenant Charles A. Miner, Co. I ; Quartermaster-Sergeant Henry B. Hatton, Co. C ; Corporal Arthur D. McIntyre, Co. G; Private Lewis H. Williams, Co. G ; Private George J. Fox, Co. I ; Private John A. Malona, Co. I ; Private Luke Phillips, Co. I ; Private Charles E. Warren, Co. I.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,

Adjutant-General.

Important Special Orders.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 14.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, February 7, 1891.

[Extract.]

I. Upon application of the Adjutant-General, State of Massachusetts, permission is hereby granted Company G, Second Regiment, Massachusetts Volunteer Militia, Captain John J. Leonard commanding, armed and equipped, to enter the State of Connecticut for the purpose of visiting the city of New Haven, February 23d and 24th.

. . . .

By order of the Commander-in-Chief.
ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 17.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, February 13, 1891.

[Extract.]

I. The nomination of Sergeant William J. Cullen of New London for First Lieutenant, and of Private Richard T. Cullen of New London for Second Lieutenant, of Company D, Third Regiment, Connecticut National Guard, is hereby disapproved.

. . . .

By order of the Commander-in-Chief.
ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 24.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, March 4, 1891.

[Extract.]

I. The nominations of Sergeant William J. Cullen, Company D, Third Regiment, Connecticut National Guard, to be First Lieutenant of said company, and of Private Richard T. Cullen of the same company to be Second Lieutenant of said company, as made by the command February 20, 1891, in compliance with S. O. No. 17 c.s., A.-G. O., are hereby disapproved.

II. In accordance with authority vested in the Commander-in-Chief by Section 3154, General Statutes, and in compliance with recommendation of the Colonel commanding, Sergeant-Major David Connor of New London is hereby appointed First Lieutenant, and Private William R. Beach is appointed Second Lieutenant, both in Company D, Third Regiment, Connecticut National Guard.

. . . .

By order of the Commander-in-Chief,
ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 53.
ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 1, 1891.

[Extract.]

I. The resignation of Joseph C. McClure, Quartermaster First Company, Governor's Horse Guard, is hereby accepted, and he is honorably discharged from the service.

. . . .

By order of the Commander-in-Chief.
GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 54.
ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 3, 1891.

Permission is hereby granted the Tenth Separate Company, National Guard, State of New York, uniformed and equipped, to enter and pass through this State, June 12th and 16th instant, on a visit to Boston, Mass.

By order of Commander-in-Chief.
ANDREW H. EMBLER
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 59.
ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 15, 1891.

[Extract.]

I. Captain Lyman S. Burr, commanding Company I, First Regiment, Connecticut National Guard, is hereby appointed Judge Advocate First Regimental District, with rank of Major from June 15, 1891, and will be recognized and respected, accordingly.

. . . .

By order of the Commander-in-Chief.
GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 62.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 15, 1891.

Upon representation to the Commander-in-Chief by His Honor, the Mayor of Bridgeport, that a condition of riotous disorder is seemingly impending in that city, coupled with a request that the municipal authority be given military aid in the emergency, Lieutenant-Colonel Louis N. Van Keuren, Assistant Adjutant-General of the Brigade Connecticut National Guard, is hereby directed and empowered to call out for duty such portion of the National Guard located in Bridgeport, as in his judgment may be required, reporting his action and the result thereof to the Adjutant-General as early as practicable.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 72.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 22, 1891.

Orderly Sergeant William W. Whitehead, First Company Governor's Horse Guard, is hereby appointed Quartermaster, with rank from June 18, 1891, *vice* Joseph C. McClure, resigned.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 73.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 24, 1891.

The time for qualification in third and fourth classes rifle practice, of all members of the Second Regiment, Connecticut National Guard, is hereby extended to September 15, 1891.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 74.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, June 27, 1891.

Permission is hereby granted Company C, First Regiment, Hibernian Rifles, Captain James Burke commanding, under arms, uniformed and equipped, to be absent from the State July 3d to 6th proximo inclusive, to attend the National Encampment of the Irish American Military Union at Staten Island, N. Y.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT,

SPECIAL ORDERS, No. 78.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, July 1, 1891.

Captain James C. Pratt, commanding First Company Governor's Foot Guard, is hereby ordered to warn the members of said company to appear at their armory on or before July 10th instant, to nominate by ballot a Major commanding, *vice* Kinney, deceased, and in like manner make nominations for any vacancies in the commissioned officers of said company occurring by reason of the nomination above ordered, and make return of the nominations so made to this office without delay, transmitting therewith one of his original orders issued in compliance herewith.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 80.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, July 9, 1891.

E. Henry Hyde, of Hartford, is hereby appointed Major commanding First Company, Governor's Foot Guard, with rank from July 6, 1891, *vice* Kinney, deceased.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 89.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, July 18, 1891.

[Extract.]

I. The resignation of Major Frank Cowles, First Company Governor's Horse Guard, is hereby accepted, and he is honorably discharged from the military service of the State.

. . . .

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, }
No. 96. }

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, August 8, 1891.

I. The Staff of the Commander-in-Chief is hereby ordered to report at Camp Watson, State Military Rendezvous, Niantic, Conn., Saturday, August 15, 1891, fully uniformed, equipped, and mounted for eight days' duty in attendance upon the Commander-in-Chief.

II. The Assistant Adjutant-General and Assistant Quartermaster-General will report in like manner for nine days' duty on Friday, August 14, 1891.

III. The Quartermaster-General will provide quarters for the Commander-in-Chief and Staff.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, }
No. 97. }

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, August 10, 1891.

Promotions and appointments are hereby made in the First Company Governor's Horse Guard, as follows:

Captain William G. Hubbard of Bloomfield to be Major, *vice* Cowles, resigned; First Lieutenant Francis M. Warren of Hartford to be Captain, *vice* Hubbard, promoted; Cornet Henry D. Clark of Hartford to be First Lieutenant, *vice* Warren, promoted; Quartermaster William W. Whitehead of Hartford to be Cornet, *vice* Clark, promoted; Corporal Joel C. Taft of East Hartford to be Quartermaster, *vice* Whitehead, promoted — all with rank from July 30, 1891.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, }
No. 98. }

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, August 12, 1891.

I. The Major commanding First Company Governor's Horse Guard will detail one sergeant and four men of his command, to report to the Adjutant-General at Camp Watson, State Military Rendezvous, Niantic, Conn., on Saturday, 15th instant, fully uniformed and equipped for eight days' orderly and escort duty in attendance upon the Commander-in-Chief and Staff.

II. Major Hubbard will make requisition for the necessary transportation and quarters, and the non-commissioned officer in charge of the detail will report to the Quartermaster of the First Regiment, Connecticut National Guard, for assignment of transportation to and from camp.

III. Muster pay-rolls for duty, in accordance with law and regulations governing the Connecticut National Guard, will be rendered on the last day of the encampment by the officer in charge of the detail.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, No. 107.

Adjutant-General's Office,
Hartford, Sept. 10, 1891.

The time for qualification in second class rifle practice, of members of Company B, Third Regiment, Connecticut National Guard, is hereby extended to September 15th instant.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, No. 110.

Adjutant-General's Office,
Hartford, Sept. 17, 1891.

Permission is hereby granted the First Separate Company, Connecticut National Guard, Captain Daniel S. Lathrop commanding, to leave the State under arms, uniformed and equipped, October 6–7 proximo, on a visit to Providence, R. I.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, No. 112.

Adjutant-General's Office,
Hartford, Sept. 23, 1891.

Permission is hereby granted Company K, First Regiment, Connecticut National Guard, Captain Charles H. Slocum commanding, under arms, uniformed and equipped, to leave the State October 2–3 proximo, on a visit to Great Barrington, Mass.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 114.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, Sept. 26, 1891.

Permission is hereby granted the First Company Governor's Foot Guard, Major E. Henry Hyde, Jr., commanding, under arms, uniformed and equipped, to be absent from the State September 28th and 29th instants, on a visit to Albany, N. Y.

By order of the Commander-in-Chief.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 121.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, Oct. 21, 1891.

Permission is hereby accorded Troop A, First Battalion Cavalry, Massachusetts Volunteer Militia, Captain A. D. Nichols commanding, armed, uniformed, and equipped, to enter and pass through this State October 26th and return October 31st instant, *en route* to and from Washington, D. C.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 126.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, Nov. 6, 1891.

Dr. E. Cornet of Colchester is hereby appointed Post-Surgeon New London County, *vice* Chase, deceased, and will be governed by the provisions of G. O. No. 22, c. s., this office.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

SPECIAL ORDERS, No. 129.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, Nov. 10, 1891.

Dr. William Clarence Brownson of New Canaan is hereby appointed Post-Surgeon Fairfield County, *vice* Brownson, resigned, and will be governed by the provisions of G. O. No. 22, c. s., this office.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, }
No. 131. }

Adjutant-General's Office,
Hartford, Nov. 10, 1891.

[Extract.]

I. The resignations of Captain and First Lieutenant James C. Pratt, and of Third Lieutenant Fayette C. Clark, First Company Governor's Foot Guard, are hereby accepted, and they are honorably discharged from the military service of the State.

. . . .

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, }
No. 135. }

Adjutant-General's Office,
Hartford, Nov. 13, 1891.

[Extract.]

I. The nomination of First Sergeant John F. Amburn to be Second Lieutenant of Company C, Third Regiment, Connecticut National Guard, having been forwarded with the disapproval of the company, regimental and brigade commanders, is disapproved by the Commander-in-Chief.

. . . .

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

Special Orders, }
No. 140. }

Adjutant-General's Office,
Hartford, Nov. 27, 1891.

Promotions and appointments in the First Company Governor's Foot Guard are hereby made as follows:

Fourth Lieutenant William S. Dwyer of Hartford, to be Captain and First Lieutenant, *vice* Pratt, resigned; Ensign Albert C. Bill of Hartford, to be Third Lieutenant, *vice* Clark, resigned; First Sergeant Robert R. Pease of Hartford, to be Fourth Lieutenant, *vice* Dwyer, promoted; Sergeant Fred R. Bell of Hartford, to be Ensign, *vice* Bill, promoted — all with rank from Nov. 19, 1891.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

Circulars.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,
CIRCULAR. HARTFORD, Feb. 25, 1891.

In filling out requisitions for State Decorations authorized in G. O. No. 4, c. s., commanding officers will please cut out from the extra copies of the order herewith enclosed the specifications as to such decorations relating to their own respective commands, and paste the same upon the requisition blanks, in lieu of copying them thereon in writing, as heretofore.

By direction of the Adjutant-General.

GEORGE M. WHITE,
Assistant Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,
CIRCULAR. HARTFORD, August 6, 1891.

TO THE CONNECTICUT NATIONAL GUARD:

I am directed by the Commander-in-Chief to congratulate officers and enlisted men upon the showing made by all organizations of the Brigade, in responding to the late telegraphic drill calls.

While not, in an exact sense, emergency calls, because of the notice given of probable time of assembling, still the intent of the drill was fulfilled, and demonstrated, as do the exercises of a drill season in Skirmish, Guard, or Battalion Manœuvres, the necessity for, and result of systematic work.

The main purpose of G. O., A.-G. O., No. 16, was to present an object-lesson to the Guard, especially the officers. To put in form a possible tour of serious duty, and to show in practice how the several organizations should be prepared, at all times, to answer the only probable, and most important summons the Connecticut National Guard is likely ever to have.

The call, as made, has been criticised somewhat, because the commands could have been assembled so much easier, and possibly more speedily, by an alarm on fire or church bells. Such is probably the fact, but it is a more pertinent fact that instruction in the A B C's of meeting an enemy, would be needed by one who gave a mob equal notice with his command to get ready for a trial of strength. In case of real trouble, an alarm that notified rioters as well as soldiers would probably bring the rioters first to possess your Armory and arms. It need not be remarked that you want all the advantage you can get on your own side, and so, the general alarm, the "long roll," so to speak, should, as a rule, be sounded only in cases of public calamity, or for service away from your own locality.

This drill has undoubtedly shown Captains of Companies defects in their squading system, and they now see where improvement can be made. One feature has presented itself to all, I have no doubt; that is, the necessity for a double squading, since the chief of a squad for a night-call would find his men inconveniently located for a day-call.

The utility of keeping uniforms and equipments always at the Armory, aside from and beyond their responsibility for State property, must have suggested itself to Captains of Companies and other officers. Attention need not be called to the probable fate of a soldier, hurrying in uniform to join his Company if a riot were the cause of the call.

It is suggested to Commandants of Regiments that an excellent practice for the next drill season, that will serve to keep the system in full vogue, and that may be of incalculable benefit to the well-being and good name of the Connecticut National Guard some day, will be the assembling of their Commands, where there are two or more Companies in a locality, for Battalion drill, by the call as recently practiced (individual notification), and once, at least, during the drill season, for the same purpose, by the Bell, or other general alarm. At any rate, the present condition for prompt assembling should not be permitted to die out by lack of use.

From the detailed reports received at this office it appears that the average of the 47 organizations of the Brigade ordered out by this call, was a presentation of better than 56 per cent. of their strength, uniformed, armed, and with ammunition distributed, in 45 minutes from the receipt of order by the commandants of organizations, and that in an average of 60 minutes, 75 per cent. of the strength of organizations called was present, ready for duty. Of the 25 per cent. absent, at least 75 per cent. is reported "out of town."

This is a commendable display of promptness and zeal. Special examples of pride in their organizations noted, are in Co. G, 2d Regiment, 60 officers and enlisted men in 45 minutes; Co. H, 2d Regiment, 32 members in 19 minutes. Captain Pearne had printed notices served (par. 1929 Reg. C. N. G.), and presented 48 officers and enlisted men in 34 minutes, after receipt of telegram. Co. E, 1st Regiment, had 4 members report within 60 minutes, who came from Plainville, 5 miles distant; and Co. C, 3d Regiment, had 7 members, 4 miles distant from the Armory, who reported on time, 3 of the 7 making the journey on foot.

The reports, condensed, were as follows:

Company, Platoon, and Corps.	1st Regt.		2d Regt.		3d Regt.		4th Regt.		Separate Companies.		
	Men.	Min.	Men.	Min.	Men.	Min.	Men.	Min.	No.	Men.	Min.
Company A, . .	34	37	34	24	38	45	—	—	1st,	34	42
'' B, . .	30	51	36	57	43	45	42	38	2d,	29	85
'' C, . .	37*	17	32	62	43	50	27	95	..	..	..
'' D, . .	45	49	37	58	28	35	34	70	..	..	..
'' E, . .	34	59	38	61	32	35	35	30	..	..	..
'' F, . .	28	30	23†	—	33	70	30	39	..	..	..
'' G, . .	38	66	34	26	46	58	37	25	..	..	..
'' H, . .	36	43	32	19	—	—	—	—	..	..	..
'' I, . .	34	50	30	35	44‡	25	38	40	..	..	..
'' K, . .	26	45	40	70	—	—	30	35	..	..	..
M.-G. Platoon, .	5	36	8	42	7	20	8	19	..	..	..
Signal Corps, . .	4	14	7	69	9	19	9	34	..	..	..
Hospital Corps, .	—	—	3	60	—	—	—	—	..	..	..

* Co. C, 1st Regiment. Captain allowed assembly to be sounded by musicians; *poor judgment*, not in accord with orders.

† Co. F, 2d Regiment. Battalion formed before the required 50 per cent. had reported. 35 men had reported before Battalion was dismissed.

‡ Co. I, 3d Regiment. Happened to be drill or meeting night.

NOTE.— Cos. H and K, 3d Regiment, and A and H, 4th Regiment, vacant. Hospital Corps 1st, 3d, and 4th Regiments not called.

ANDREW H. EMBLER,
Adjutant-General.

STATE OF CONNECTICUT.

ADJUTANT-GENERAL'S OFFICE,
HARTFORD, August 13, 1891.

CIRCULAR.

TO COMPANY COMMANDERS, C. N. G.:

The proper preparation of Muster Pay-Rolls for duty performed by organizations of the Connecticut National Guard ought to be thoroughly understood by every commanding officer. Hereafter, failure in this respect will be noted as evidence of incapacity on the part of all commanding officers whose rolls have to be returned to them for correction.

Attention is called to the following requirements, neglect of which has heretofore been a frequently occurring source of error:

Care should be taken in the first entry of names upon the roll that they be written precisely as written in commission or enlistment paper, at least one Christian name and the surname being written out in full; and the soldier should invariably sign his name in the same manner.

All columns of figures should be carefully footed and found to balance.

When an organization desires to transfer to its Treasurer the pay vouched for by its Muster Pay-Roll, such transfer must be authorized by a unanimous vote of the organization, taken on or before the last day of the encampment. Such vote must be certified to by its secretary and commanding officer, and that certificate must in all cases accompany the Muster Pay-Roll to which it pertains. For this purpose a printed form for such certificate of transfer is appended at the bottom of the inner fold of all M. P.-R. blanks issued since July 17th ult. In filling out this certificate, care should be taken to state accurately in figures, as indicated by the printed portion of the blank, the precise amount intended to be covered by the vote of transfer. If the transfer is intended to cover the total amount of pay proper, and ration allowance, the amount named should correspond therewith. If intended to cover only per diem pay of members, only the total amount of such pay, without ration allowance, should be given.

Company Muster Pay-Rolls for duty at the anuual encampment, properly attested by oath of the commanding officer, should invariably be handed to the Assistant Adjutant-General, not later than 10 o'clock A.M., on the last day of the encampment. To facilitate such rendering of completed rolls, a Notary Public will be on duty at the quarters of the Assistant Adjutant-General in camp on that day, who will officiate without fee.

Men in camp whose terms of enlistment expire from the 17th to 22d inst. inclusive will, on proper application, be discharged in orders issued August 31st, to date from day of expiration of term.

By order of the Commander-in-Chief.

ANDREW H. EMBLER,
Adjutant-General.

REPORT

OF THE

QUARTERMASTER-GENERAL

OF THE

STATE OF CONNECTICUT,

TO THE

COMMANDER-IN-CHIEF,

FOR THE

Fiscal Year Ending June 30, 1891.

HARTFORD, CONN.:
Press of The Fowler & Miller Company, 341 Main Street.
1892.

AUDITORS' REPORT.

To His Excellency, Morgan G. Bulkeley, Governor:

This certifies that we, the Auditors of Public Accounts, have examined the accounts of Wm. B. Rudd, Quartermaster-General, from July 1, 1890, to June 30, 1891, inclusive, compared the vouchers therewith, and find the same correct; that we have also examined the special account pertaining to the special appropriation of four thousand dollars ($4,000), made by the General Assembly of 1889, for a military road at Niantic, compared the vouchers therewith, and find the same correct, showing a balance in the hands of the Quartermaster-General amounting to five hundred and thirty-five dollars and forty cents ($535.40); that we have also examined the State Camp Grounds, the Arsenal Buildings, and all the property therein contained, and find that it appears to have been properly cared for, and we are of the opinion that the duties of the department have been faithfully and efficiently performed.

GEORGE F. LINCOLN, } *Auditors of*
D. WARD NORTHROP, } *Public Accounts.*

HARTFORD, CONN., August 31, 1891.

REPORT.

STATE OF CONNECTICUT,
QUARTERMASTER-GENERAL'S OFFICE,
HARTFORD, June 30, 1891.

To His Excellency, Morgan G. Bulkeley, Governor and Commander-in-Chief:

SIR,—I have the honor to submit herewith my report for the fiscal year ending June 30, 1891.

Very respectfully,
Your obedient servant,
WILLIAM B. RUDD,
Quartermaster-General.

DR. STATE OF CONNECTICUT IN ACCOUNT WITH BRIG.-

1891.		
June 30.	To cash expended care Public Property,	$6,264 74
	Office Expense,	653 30
	Contingent,	412 95
	Arsenal Repairs,	248 72
	Freight and Express,	381 16
	CONNECTICUT NATIONAL GUARD.	
	Military Stores and Encampment,	11,118 57
	Transportation,	6,491 47
	Uniforms,	3,431 35
	Uniform Repairs,	297 96
	Officers' Compensation,	2,347 46
	Uniform Compensation,	1,700 00
	Care of Arms,	977 11
	Rifle Ranges,	1,440 16
	Armory Rents,	7,687 17
	New Haven Armory,	3,107 77
	Hartford Armory,	2,083 85
	Bridgeport Armory,	1,439 59
	New London Armory,	1,635 86
	New Britain Armory,	1,631 90
	Norwalk Armory,	895 92
	Waterbury Armory,	1,360 07
	Ammunition,	2,692 62
	Niantic Camp Ground,	1,690 76
		$59,990 46
	GOVERNOR'S GUARDS.	
	Uniforms, Equipments, and Military Stores,	$1,537 50

DR. STATE OF CONNECTICUT IN ACCOUNT WITH BRIG.-

1891.	SPECIAL ACCOUNT.	
June 30.	To cash expended,	$3,464 60
	Balance on hand,	535 40
		$4,000 00

GEN. WILLIAM B. RUDD, QUARTERMASTER-GENERAL. CR.

1890.			
July 1.	By cash received,	Balance,	$9 46
1891.			
June 30.	By cash received,	Orders of Comptroller,	54,003 20
		Sales and Missing Property,	430 83
		Care Public Property,	34 00
		Contingent,	178 75
		Freight and Express,	9 00
		Connecticut National Guard,	253 89
		Transportation,	1,720 06
		Uniforms,	11 93
		New Haven Armory,	350 00
		Hartford Armory,	1,787 74
		New London Armory,	10 00
		New Britain Armory,	440 00
		Norwalk Armory,	168 80
		Niantic Camp Ground,	95 63
		Ammunition,	487 17
			$59,990 46

GOVERNOR'S GUARDS.

1891.		
June 30.	By cash received, Order of Comptroller,	$1,537 50

GEN. WILLIAM B. RUDD, QUARTERMASTER-GENERAL. CR.

MILITARY ROAD AT NIANTIC.

1890.		
August 6.	By cash received, Order of Comptroller,	$4,000 00
		$4,000 00

Table I

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General.

CLASS A. CAMP AND GARRISON EQUIPAGE.

TENTS AND EQUIPMENTS.

July 1, 1890, to June 30, 1891	Tents.							Tent Flies.						Tent Floors.					
	Headquarter.	Colonel's.	Headquarter Wall.	Hospital.	Wall.	Improved Common.	Common (A)	Headquarter	Colonel's.	Headquarter Wall	Hospital.	Wall.	Headquarter Wall, double.	Headquarter.	Colonel's.	Headquarter Wall.	Hospital	Wall.	Common.
Remaining on hand June 30, 1890,	2	4	5	2	327	759	103	2	4	5	2	337	2		4			274	758
Received from Connecticut National Guard,						1													
Received from United States Government,					50							100							
Received from purchase,			3							3									
Taken up,													1	2		5	2		11
Total to be accounted for,	2	4	8	2	377	760	103	2	4	8	2	437	3	2	4	5	2	274	769
Issued to Connecticut National Guard,						1													
Issued to Soldiers' Home, Noroton, Conn.,					1							1							
Issued to Governor's Guard,																			
Expended,																		8	
Total issued, expended, dropped, and sold,					1	1						1						8	
Remaining on hand, June 30, 1891,	2	4	8	2	376	759	103	2	4	8	2	436	3	2	4	5	2	266	769

July 1, 1890, to June 30, 1891	Tent Poles, Sets.							Tent Stakes and Pins.			
	Headquarter.	Colonel's.	Headquarter Wall.	Hospital.	Wall.	Common.	Ridge Irons.	Stakes, large	Stakes, small.	Pins, large.	Pins, small.
Remaining on hand June 30, 1890,	2	4	5	2	625	897	500	352		10145	19212
Received from Connecticut National Guard,						1					
Received from United States Government,					50					600	3900
Received from purchase,			5					50	200		
Taken up,											
Total to be accounted for,	2	4	10	2	675	898	500	402	200	10745	23112
Issued to Connecticut National Guard,						1					
Issued to Soldiers' Home, Noroton, Conn.,					1					20	16
Issued to Governor's Guard,											
Expended,						47		25			3096
Total issued, expended, dropped, and sold,					1	48		25		20	3112
Remaining on hand, June 30, 1891,	2	4	10	2	674	850	500	377	200	10725	20000

July 1, 1890, to June 30, 1891	Beds and Furniture.																	
	Iron Bedsteads, U. S.	Woven Wire Beds.	Slat Cot Beds.	Cots, canvas.	Mattresses, U. S.	Mattresses, common.	Mattresses, cotton top.	Bed Sacks.	Pillows.	Pillow Cases.	Sheets.	Bedspreads.	Towels.	Rugs, Governor's	Druggets.	Camp Desks.	Tables, Walnut.	Tables, Pine.
Remaining on hand June 30, 1890,		49	37			2293	17	1764	67					4	12	4	6	248
Received from Connecticut National Guard,																		
Received from United States Government,	200				200													
Received from purchase,		12	6			100	12											
Taken up,		1		6						46	84	3	80					13
Total to be accounted for,	200	62	43	6	200	2393	29	1764	67	46	84	3	80	4	12	4	6	261
Issued to Connecticut National Guard,																		
Issued to Soldiers' Home, Noroton, Conn.,																		
Issued to Governor's Guard,																		
Expended,								764										
Total issued, expended, dropped, and sold,								764										
Remaining on hand, June 30, 1891,	200	62	43	6	200	2393	29	1000	67	46	84	3	80	4	12	4	6	261

July 1, 1890, to June 30, 1891	Beds and Furniture.														
	Chairs, splint seat.	Chairs, common.	Camp Chairs, canvas	Washstands.	Mirrors.	Wash Basins.	Wash Bowls.	Water Pitchers	Wood Pails.	Candlesticks.	Gun Racks.	Bases for Gun Racks	Hanging Lamps.	Cups, Tin.	Dippers.
Remaining on hand June 30, 1890,	22	656		18	17	793			926	706	840	700	53	1332	68
Received from Connecticut National Guard,															
Received from United States Government,															
Received from purchase,	6		24	13	12				72				15		
Taken up,	7			5		45	41	41							
Total to be accounted for,	35	656	24	36	29	838	41	41	998	706	840	700	68	1332	68
Issued to Connecticut National Guard,															
Issued to Soldiers' Home, Noroton, Conn.,															
Issued to Governor's Guard,															
Expended,	1	37							192		80		10	132	1
Total issued, expended, dropped, and sold,	1	37							192		80		10	132	1
Remaining on hand, June 30, 1891,	34	619	24	36	29	838	41	41	806	706	760	700	58	1200	67

FLAGS.

July 1, 1890, to June 30, 1891	Garrison	Storm	State.	Post.	Hospital	Governor's.	National Colors	State Colors.	Governor's Colors.	Camp Colors	Color Covers	Color Belts, Regimental.	Guidons.	Markers	Naval Signals.	Rebel Trophies	Staffs.	Halyards, set.
Remaining on hand June 30, 1890,	1	1	3	1	1	1	4	1	3	2	4	4	3	2	25	3	4	5
Received from Connecticut National Guard,				1			1											
Received from United States Government,	1	2		2														
Received from purchase,				1		1	1		2	2			3	4				
Taken up,																		
Total to be accounted for,	2	3	3	5	1	2	6	1	5	4	4	4	6	6	25	3	4	5
Issued to Connecticut National Guard,				1			1						1					
Issued to Soldiers' Home, Noroton, Conn.,																		
Issued to Governor's Guard,												2						
Expended,									2									
Total issued, expended, dropped, and sold,				1			1		2			2	1					
Remaining on hand, June 30, 1891,	2	3	3	4	1	2	5	1	3	4	4	2	5	6	25	3	4	5

DRUMS.

July 1, 1890, to June 30, 1891	Snare	Heads	Slings	Sticks, pairs	Cords	Hoops, Flesh	Hoops, Rims	Ears.	Hooks.	Sets of Snares	Snare Tighteners	Covers.
Remaining on hand June 30, 1890,	2	23	33		20							11
Received from Connecticut National Guard,	9		2	2½								
Received from United States Government,	10											10
Received from purchase,		69		24	36					12		
Taken up,						19	26	80	585		33	
Total to be accounted for,	21	92	35	26½	56	19	26	80	585	12	33	21
Issued to Connecticut National Guard,	12	45	8	10½	17	1		14		2		2
Issued to Soldiers' Home, Noroton, Conn.,												
Issued to Governor's Guard,		5			2					1		
Expended,					5		2		15			
Total issued, expended, dropped, and sold,	12	50	8	10½	24	1	2	14	15	3		2
Remaining on hand, June 30, 1891,	9	42	27	16	32	18	24	66	570	9	33	19

MISCELLANEOUS.

July 1, 1890, to June 30, 1891	Brooms, Floor	Brooms, Barn	Brooms, Lawn	Rakes	Spades.	Shovels.	Mallets.	Mallet Handles.	Mauls and Handles	Manure Forks.	Axes.	Half Axes.	Pick Axes.	Axe Helves	Pick Axe Helves	Wheelbarrows	Baskets.	Camp Signs, sets	Camp Signs, single
Remaining on hand June 30, 1890,	93	72	72	71	33	31	47		18	25	17	9	57		5	10	96	8	40
Received from Connecticut National Guard,																			
Received from United States Government,																			
Received from purchase,				24	12		25	10						6	12		24		
Taken up,							32												
Total to be accounted for,	93	72	72	95	45	31	104	10	18	25	17	9	57	6	17	10	120	8	40
Issued to Connecticut National Guard,																			
Issued to Soldiers' Home, Noroton, Conn.,																			
Issued to Governor's Guard,																			
Expended,	18	2	1	5	1					5		4					15		
Total issued, expended, dropped, and sold,	18	2	1	5	1					5		4					15		
Remaining on hand, June 30, 1891,	75	70	71	90	44	31	104	10	18	20	17	5	57	6	17	10	105	8	40

July 1, 1890, to June 30, 1891	Telephone Equipment, set	Head Lights	Lanterns.	Force Pumps	Sand Pumps	Field Glasses, S. S.	Camp Badges, O. M.-G.	[illegible]	Garbage Cans	Canvas Covers for Wagons	Ambulance Wagons	Stretchers, Hospital	Medicine Chests	Hospital Knapsacks	Surgical Instruments, sets	Water-proof Cases for Surgical Instruments	Furniture, Gov. Quarters, set	Lounges	Street Lamps.
Remaining on hand June 30, 1890,	1	13	38	23		1	50		36	15	2	6	1	1	1	1	1		
Received from Connecticut National Guard,																			
Received from United States Government,																			
Received from purchase,			72						64									1	2
Taken up,		8		5	1			4										1	
Total to be accounted for,	1	21	110	28	1	1	50	4	100	15	2	6	1	1	1	1	1	2	2
Issued to Connecticut National Guard,												1							
Issued to Soldiers' Home, Noroton, Conn.,																			
Issued to Governor's Guard,																			
Expended,			5																
Total issued, expended, dropped, and sold,			5									1							
Remaining on hand, June 30, 1891,	1	21	105	28	1	1	50	4	100	15	2	5	1	1	1	1	1	2	2

TABLE 2.

PROPERTY RETURN.

WILLIAM B. RUDD, QUARTERMASTER-GENERAL.

CLASS B. CLOTHING.

	UNIFORMS.								CHEVRONS.																COAT, HELMET, AND CAP TRIMMINGS.												MISCELLANEOUS.							
JULY 1, 1890, TO JUNE 30, 1891.	Uniform Coats.	Trousers.	Helmets, complete.	Blouses.	Forage Caps, complete.	Overcoats.	Buff Vests, G. F. G.	Buff Trousers, G. F. G.	Quartermaster-Sergeant, Regimental, pairs.	Chief Trumpeter, pairs.	Drum-Major, pairs.	Chief Musician, pairs	Hospital Steward, pairs.	Sergeant-Major, pairs.	Sergeant, First, pairs.	Sergeant, Quartermaster, Company, pairs.	Sergeant, Signal Corps, pairs.	Sergeant, pairs.	Sergeant, Color, pairs.	Corporal, pairs	Corporal, Signal Corps, pairs.	Arm Brassards.	Devices, Signal Service, pairs.	Devices, Trumpeters, pairs	Uniform Coat, numbers.	Helmet Plumes, G. H. G.	Helmet Spikes.	Helmet Eagles, complete.	Helmet Buttons.	Forage Cap, letters.	Forage Cap, numbers.	Forage Cap, devices.	Helmets, G. H. G.	Forage Caps, G. H. G.	Leggins, pairs, G. H. G.	Gauntlets, pairs, G. H. G.	Blankets, assorted.	Blankets, U. S.	Blanket Cases.	Overcoat Cases.	Buttons, State, large.	Buttons, State, small.	Buttons, Governor's Staff, vest and coat.	Shoulder Scales, pairs, G. H. G.
Remaining on hand June 30, 1890,	109	140	125	72	80	99		....	2	6	4	2	2	2	2	2	2	10	1	22	2	2	27	54	..		..	....	....		....	..	..	..	..	..	1472	67	54	10	...	269	185	..
Received from Connecticut National Guard,	236	344	93	178	121	65	....	....	....		2	..	..	..	2	2	..	11	..	16	..	..	..	1	....	..		....	...	...	...	..	..	..	..	..	13	52	2	2	24	24	...	..
Received from purchase,	41	115	19	158	234	62	100	100	....	1	1	..	..		1	1	..	8		8	..	..	..	..	....	18	....	....		....	.	..	27	10	28	10	....	....	..	..	1728	1296	.	15
Received from United States Government,	....	...	....	....	....		..	....	....	..		..	.		..	.			..	..	..	..		..	....	..	...	...	.	....	....	..	..		..		....	600	.	..	..	..	.	..
Taken up,	....	....	....		...		..	...	....	..	..	..	.		..	....			..	..	..	..	..	.	317	..	131	128	141	1023	192	5	..	..	.		1	....	4	..	...	....		..
Total to be accounted for,	386	599	237	408	435	226	100	100	2	7	7	2	2	2	5	5	2	29	1	46	2	2	27	55	317	18	131	128	141	1023	192	5	27	10	28	10	1486	719	60	12	1752	1589	185	15
Issued to Connecticut National Guard,	235	345	139	308	234	141	..	..	....	2	1	..		..	3	2	..	15	..	24		..	18	9	....		13	..	...	73	73			..		..	21	614	18	2	646	597	.	..
Issued to Governor's Guard,	8	...	....	.	....	....	100	100	....	.	..	..			..	...	.	..	..	..	..	..	..		....	18	....	....	....				27	10	28	10	....		..		...	...	....	15
Sold,	....	1	....	....	4	....	....	....	....	..	..	2	..	..		...	..	1	1	4	..		..	2	....	..	....	..	..	...		..	..		..		....	.	..	..	358	334	...	..
Expended,	....	....	..	..		....	....			1	1		..		..	....	..		..	.	.	..	..	..	13		....	18	11	15	26		..	..	..	..	19	....	..		...	30	...	..
Total issued, expended, dropped, and sold,	243	346	139	308	238	141	100	100	....	3	2	2	..	..	3	2	..	16	1	28	.		18	11	13	18	13	18	11	88	99	..	27	10	28	10	40	614	18	2	1004	961	.	15
Remaining on hand June 30, 1891,	143	253	98	100	197	85	...	....	2	4	5	..	2	2	2	3	2	13		18	2	2	9	44	304	..	118	110	130	935	93	5	..		..	..	1446	105	42	10	748	628	185	..

Table No. 3.

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General.

CLASS C. ORDNANCE AND ORDNANCE STORES.

July 1, 1890, to June 30, 1891.	Guns and Mortars.											Artillery Carriages.								
	Rifled.		Smooth Bore.			Mortar.	Trophies.													
	6-pdr. Bronze, cal. 3.80.	12-pdr. Steel Prussian, cal. 4.58.	12-pdr. Bronze, cal. 4.62.	6-pdr. Bronze, cal. 3.67.	Rodman, M. L., 10 inch.	Mortars, 10 inch.	12-pdr. Cast-iron Guns.	9-pdr. Cast-iron Guns.	6-pdr. Cast-iron Guns.	6-pdr. Wrought-iron Guns.	4-pdr. Bronze Guns.	6-pdr. Gun Carriages.	6-pdr. Caissons.	12-pdr. Gun Carriages.	12-pdr. Caissons.	12-pdr. Carriage for Steel Gun.	12-pdr. Field Howitzer Caisson.	12-pdr. Ship Carriages.	4-pdr. Ship Carriages.	Barbette Carriages and Chassis.
Remaining on hand June 30, 1890,	3	1	1	2	2	4	5	2	3	1	2	4	5	2	1	1	1	2	2	2
Received from purchase,																				
Received from 1st Company Governor's Horse Guard,																				
Taken up,																				
Total to be accounted for,	3	1	1	2	2	4	5	2	3	1	2	4	5	2	1	1	1	2	2	2
Issued to 1st Company Governor's Horse Guard,																				
Issued to 2d Company Governor's Horse Guard,																				
Issued to Connecticut National Guard,																				
Expended,																				
Total issued, expended, dropped, and sold,																				
Remaining on hand June 30, 1891,	3	1	1	2	2	4	5	2	3	1	2	4	5	2	1	1	1	2	2	2

July 1, 1890, to June 30, 1891.	Harness.								
	McClellan Saddles and Bridles.	Horse Equipments, Governor's Staff.	Spurs, pairs.	Harness, sets.	Nose Bags.	Harness Cases.	Saddle Cloths.	Curry Combs.	Horse Brushes.
Remaining on hand June 30, 1890,	1	12			5	7		34	30
Received from purchase,	4		17				83	12	12
Received from 1st Company Governor's Horse Guard,							66		
Taken up,			12	2					
Total to be accounted for,	5	12	29	2	5	7	149	46	42
Issued to 1st Company Governor's Horse Guard,							79		
Issued to 2d Company Governor's Horse Guard,			17						
Issued to Connecticut National Guard,	4						4		
Expended,					1	7		12	6
Total issued, expended, dropped, and sold,	4		17		1	7	83	12	6
Remaining on hand June 30, 1891,	1	12	12	2	4		66	34	36

July 1, 1890, to June 30, 1891.	Artillery Equipments and Implements.																			
	Sponges and Rammers for 6-pdrs.	Sponge Heads, Rammers, and Staves for 12-pdrs.	Sponge Heads, Rammers, and Staves for 6-pdrs.	Sponge Bristle for 6-pdrs.	Sponge Covers for 6-pdrs.	Sponge Covers for 12-pdrs.	Worms and Staves for 6-pdrs.	Worms and Staves for 12-pdrs.	Platforms for Rodman Guns.	Platforms for Mortars.	Mortar Beds.	Implements for Sea Coast Battery, set.	Hand Spikes for Field Guns.	Tompions, brass, for 6-pdrs.	Tompions, brass, for 12-pdrs.	Tompions, wood, for Field Guns.	Paulins.	Tar Buckets.	Priming Wires.	Gunner's Haversacks.
Remaining on hand June 30, 1890,	6	3	7	6	8	5	4	2	2	4	4	1	26	2	2	13	10	24	14	20
Received from purchase,																				
Received from 1st Company Governor's Horse Guard,																				
Taken up,																				
Total to be accounted for,	6	3	7	6	8	5	4	2	2	4	4	1	26	2	2	13	10	24	14	20
Issued to 1st Company Governor's Horse Guard,																				
Issued to 2d Company Governor's Horse Guard,																				
Issued to Connecticut National Guard,																				
Expended,																			3	
Total issued, expended, dropped, and sold,																			3	
Remaining on hand June 30, 1891,	6	3	7	6	8		4	2	2	4	4	1	26	2	2	13	10	24	11	20

July 1, 1890, to June 30, 1891.	Artillery Equipments and Implements.																				
	Gunner's Gimlets.	Thumb Stalls.	Tow Hooks.	Vent Punches.	Wrenches for Gun Carriages.	Fuse Reamers.	Fuse Pouches.	Fuse Setters.	Lanyards.	Caisson Bolts.	Aiming Tripod	Fuse Gouges.	Prolonges.	Sponge Buckets.	Watering Buckets, Gutta Percha.	Gunner's Pincers.	Gunner's Shears, pairs.	Vent Covers.	Tube Pouches.	Pole Pads.	Sights.
Remaining on hand June 30, 1890,	9	73	21	12	8	11	18	2	14	6	3	2	4	2	7	3	3	5	8	8	1
Received from purchase,																					
Received from 1st Company Governor's Horse Guard,																					
Taken up,																					
Total to be accounted for,	9	73	21	12	8	11	18	2	14	6	3	2	4	2	7	3	3	5	8	8	1
Issued to 1st Company Governor's Horse Guard,																					
Issued to 2d Company Governor's Horse Guard,																					
Issued to Connecticut National Guard,																					
Expended,	4	4	1	12					6							1					
Total issued, expended, dropped, and sold,	4	4	1	12					6							1					
Remaining on hand June 30, 1891,	5	69	20		8	11	18	2	8	6	3	2	4	2	7	2	3	5	8	8	1

Table 4.

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General.

CLASS C. ORDNANCE AND ORDNANCE STORES, No. 2

Small Arms and Accoutrements.

July 1, 1890, to June 30, 1891.	Rifles.												Smooth-Bore.			Bayonets.					Revolvers		Swords.		
	Peabody Breech-Loading Rifled Muskets, cal. 45.	Springfield B.-L. Rifled Muskets, cal. 45.	Springfield B.-L. Rifles, cal. 45, new model.	Whitney Rifled Musket, cal 58.	Mississippi Rifled Musket.	Norfolk Rifled Musket, cal. 58.	Flint-Lock Rifled Musket.	Sharps' Rifle 36-in. barrel.	Spencer's Rifle.	Colt's Revolving Rifle, cal. 56.	Sharps' Carbine.	Windsor Rifle.	Cadet Muskets.	Flint-Lock Muskets, trophies.	Flint-Lock Muskets, Breech-Loader.	For Peabody B.-L. Rifled Muskets, cal. 45.	For Springfield B.-L. Rifled Muskets, cal. 45.	For Flint-Lock Muskets, trophies.	For Springfield, cal. 58.	Sabre.	Colt's, cal. 45.	Cavalry Pistols.	Artillery Sabres.	N.-C. S. Swords.	Field Officer Sabres, U. S.
Remaining on hand June 30, 1890,	76	41	23	1	1	1	1	1	1	1	1	1	1	44	1	106	298	24	2	1	96	1	42	6	....
Received from Connecticut National Guard,	1	55	8	....	..	....	..	..	..	..	..	..	....	....	....	2	64	....	..	..	...	....	....	1	....
Received from purchase,	....	....	...	..	..	..	..	..	..	..	..	..	...	....	....	...	...	....	..	..	...	....	...	...	....
Taken up,	....	....	...	....	..	....	..	..	..	..	..	..	...	..	....	..	....	....	..	..	...	....	....	....	....
Received from United States Government,	...	....	62	....	..	....	..		..	..	..	..	....	....	....	...	62	....	..	..	...	....	....	....	10
Total to be accounted for,	77	96	93	1	1	1	1	1	1	1	1	1	1	44	1	108	424	24	2	1	96	1	42	7	10
Issued to Connecticut National Guard,	66	59	16	....	..	....	..	..	..	..	..	..	...	....	....	67	69	....	..	..	...	....	....	2	10
Sold,	...	...	...	....	..	....	..	..	..	..	..	..	....	...	....	....	...	...	..	..	....	...	....	..	....
Total issued, expended, dropped, and sold,	66	59	16	....	..	....	..	..	..	..	..	..	....	....	....	67	69	....	..	..	....	....	....	2	10
Remaining on hand June 30, 1891,	11	37	77	1	1	1	1	1	1	1	1	1	1	44	1	41	355	24	2	1	96	1	42	5	....

July 1, 1890, to June 30, 1891.	Accoutrements.																						
	Cartridge Boxes.	Bayonet Scabbards.	Waist Belts.	Waist Belt Plates.	N.-C. Staff Sword Belts.	N.-C. Staff Sword Belt Plates.	N.-C. Staff Throgs.	Holsters.	Knapsacks.	Haversacks.	Canteens.	Music Pouches.	Signal Kits, Co.	Signal Kits, Regimental.	Hunter's Hatchets.	Chamois Cases, F. O. Sabres, U. S.	Gun Slings.	Cases, Gun Packing.	Cases, Pistol Packing.	Skirmishing Bugles.	Bugle Cords and Tassels.	Flags for Signal Kits, extra.	Shoulder Belts.
Remaining on hand June 30, 1890,	88	59	78	262	5	5	3	36	13	2029	2469	.	18	7	30	....	21	20	3	2	3	5	..
Received from Connecticut National Guard,	74	81	68	82	1	1	1	..	64	....	3	..	..	..	..	....	..	3	..	1	1	..	..
Received from purchase,	1	101	24	24	..	..	..	..	85	....	....	20	..	..	..	....	..	..	..	..	1	..	20
Taken up,	....	....	....	....	..	..	2	..	....	....	...	..	..	..		....		..	..	..	1	..	..
Received from United States Government,	....	....	....	....	..	..	..	..	...	....	...	..	..	..	..	10	..	4	..	..	..	..	..
Total to be accounted for,	163	241	170	368	6	6	6	36	162	2029	2472	20	18	7	30	10	21	27	3	3	6	5	20
Issued to Connecticut National Guard,	138	145	166	171	2	2	2	..	73	....	....	20		..	..	10	..	6	..	3	5	..	20
Sold,	....	....	....	....	..	..	..	..	....	....	..	..	..	..	..	....	1		..	..	1	..	..
Total issued, expended, dropped, and sold,	138	145	166	171	2	2	2	..	73	....	....	20	..	..	..	10	1	6	..	3	6	..	20
Remaining on hand June 30, 1891,	25	96	4	197	4	4	4	36	89	2029	2472	..	18	7	30	...	20	21	3	..	..	5	..

Table 5.

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General.

CLASS C. ORDNANCE AND ORDNANCE STORES, No. 3.

	Ammunition.																		Targets.				State Decorations.															
	For Artillery.															For Small Arms.							Sharpshooter.						Marksman. First Class.						Marksman.			
July 1, 1890, to June 30, 1891.	12-pdr. Shell for Steel Gun.	12-pdr. Conical Shot, cal. 4.58.	Absterdam Shells.	Case Shot, 3-inch Guns.	Shot for 10-in. Rodman Guns, Plaster.	Friction Primers.	Rifle Powder, pounds.	Mortar Powder, pounds.	Cannon Powder, pounds.	Cartridge Bags for 3-in. Guns.	Cartridge Bags, 12-pdr. Guns.	Cartridge Bags for Rodman Guns.	Cartridge Bags for Mortars.	Time Fuses.	Fuse Plugs.	Cartridges, Metallic Ball, Cal. 45.	Cartridges, Metallic Blank, Cal. 45.	Cartridges for Pistols, Ball.	Target Houses, Wood.	Target Butt-Plates, Iron.	Targets.	Target Patches.	X Badges, Silver.	V Badges, Bronze.	Badges, Gilt.	X Bars, Silver.	V Bars, Bronze.	Bars, Gilt.	X Badges, Silver.	V Badges, Bronze.	Badges, Gilt.	X Bars, Silver.	V Bars, Bronze.	Bars, Gilt.	V Badges, Bronze.	Badges, Gilt.	V Bars, Bronze.	Bars, Gilt.
Remaining on hand June 30, 1890,	24	100	50	50		962				30	466				100	19252	2000		1		154	67050	1		1	1		1										3
Received from Connecticut National Guard,																3760															1							1
Received from United States Government,								200	300							50000																						
Received from Governor's Guard,																1158																						
Received from purchase,						1000	1287½			335						80000	68000	2000	2	9	137	200000	3	24	21	7	47	52	1	12	57	3	26	94	8	149	6	133
Received from G. A. R.,						13																																
Taken up,					25							3	17	19		1583																			1	1		
Total to be accounted for,	24	100	50	50	25	1975	1287½	200	300	365	466	3	17	19	100	155753	70000	2000	3	9	291	267050	4	24	22	8	47	53	1	12	58	3	26	94	9	150	6	137
Issued to Connecticut National Guard,						150	100			100						70914			3	9	231	77400	3	24	21	7	44	49		11	53	3	25	85	8	147	6	132
Sold,						211	312½			110	59					13694	500				2	6000						1	1		1			2	1	2		
Issued to Governor's Guard,																1000	1300				4	500																
Expended,						500	380			47	9						54000	1512				5850			1			1		1	3					1		3
Total issued, expended, dropped, and sold,						861	792½			257	68					85608	55800	1512	3	9	237	89750	3	24	22	7	44	51	1	12	57	3	25	87	9	150	6	135
Remaining on hand June 30, 1891,	24	100	50	50	25	1114	495	200	300	108	398	3	17	19	100	70145	14200	488			54	177300	1			1	3	2			1		1	7				2

Table 6.

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General,

CLASS C. ORDNANCE AND ORDNANCE STORES No. 4.

	Springfield Rifle, cal. 45. Components and Appendages.																							
July 1, 1890, to June 30, 1891.	Tips.	Tip Screws.	Band Springs (2).	Butt Plates.	Butt-plate screws (2).	Guard Plates.	Guard Bows.	Guard-bow Swivels.	Triggers.	Rear-sight Screws (rear).	Rear Sights, complete.	Front-sight Covers.	Extractors.	Hinge Pins.	Ejector Springs.	Ejector-spring Spindles.	Ejector Studs.	Cam Latches, complete.	Breech-block Cap Screws.	Firing Pins.	Firing-pin Screws.	Cam-latch Springs.	Breech Blocks, complete.	Tang Screws
Remaining on hand June 30, 1890,			459							869	36							41					48	81
Taken up,	55	48	19	5	10	5	5	35	50	147		38	125	49	337	85	48	1	318	295	201	245	1	
Received from Connecticut National Guard,																								
Received from United States Government,																								
Total to be accounted for,	55	48	478	5	10	5	5	35	50	1016	36	38	125	49	337	85	48	42	318	295	201	245	49	81
Issued to Connecticut National Guard,										25			6							15				
Expended,											2													32
Total issued, expended, dropped, and sold,										25	2		6							15				32
Remaining on hand, June 30, 1891,	55	48	478	5	10	5	5	35	50	991	34	38	119	49	337	85	48	42	318	280	201	245	49	49

	Springfield Rifle, cal. 45. Components and Appendages.																						
July 1, 1890, to June 30, 1891.	Upper Bands.	Lock Plates.	Main Springs.	Main-spring Swivels.	Hammers.	Tumblers.	Tumbler Screws.	Bridles.	Bridle Screws.	Sears.	Sear Screws.	Sear Springs.	Sear-spring Screws.	Side Screws (2).	Ramrods.	Bayonet Clasps.	Bayonet-clasp Screws.	Headless-shell Extractors with drift.	Screw-drivers.	Tumbler Punches.	Spring Vises.	Wooden Wiping-rods.	Wipers, bristle.
Remaining on hand June 30, 1890,			429		19	149	417	48	97	204	97	241	50	98	46	49		42	721	198	76		959
Taken up,	48	5	82	52	18	20		31		5		184			3		49	102	309	21		11	31
Received from Connecticut National Guard,																		6	6				
Received from United States Government,																						62	
Total to be accounted for,	48	5	511	52	37	169	417	79	97	209	97	425	50	98	49	49	49	150	1036	219	76	73	990
Issued to Connecticut National Guard,						10				14								6					33
Expended,							173							71					6				7
Total issued, expended, dropped, and sold,						10	173			14				71				6	6				40
Remaining on hand, June 30, 1891,	48	5	511	52	37	159	244	79	97	195	97	425	50	27	49	49	49	144	1030	219	76	73	950

	Peabody Rifle, cal. 45. Components and Appendages.																				
July 1, 1890, to June 30, 1891.	Fore Stocks.	Stock Bolts.	Upper Bands.	Lower Bands.	Wind-gauge Sights.	Wind-gauge Sight Slides.	Wind-gauge Sight Slide Springs.	Sight Screws.	Sight Springs.	Breech Blocks.	Guard Levers.	Guard-lever Screws.	Extractors.	Extractor Screws.	Extractor Bases.	Extractor-base Screws.	Brace Levers.	Brace-lever Springs.	Brace-lever Rollers.	Firing Pins.	Firing-pin Springs.
Remaining on hand June 30, 1890,						169															
Taken up,	29	7	35	337	11		147	64	56	16	41	154	4	107	17	59	17	18	9	43	105
Received from Connecticut National Guard,																					
Received from United States Government,																					
Total to be accounted for,	29	7	35	337	11	169	147	64	56	16	41	154	4	107	17	59	17	18	9	43	105
Issued to Connecticut National Guard,																					
Expended,						2															
Total issued, expended, dropped, and sold,						2															
Remaining on hand, June 30, 1891,	29	7	35	337	11	167	147	64	56	16	41	154	4	107	17	59	17	18	9	43	105

	Peabody Rifle, cal. 45. Components and Appendages.																				
July 1, 1890, to June 30, 1891.	Triggers.	Trigger Screws.	Trigger-base Plates.	Butt Plates.	Butt-plate Screws (long).	Butt-plate Screws (short).	Lock Plates.	Lock-plate Screws (long).	Lock-plate Screws (short).	Hammers.	Hammer Screws.	Main Springs.	Main-spring Screws.	Main-spring Swivels.	Bridles.	Bridle Screws.	Sear Screws.	Tumblers.	Rammers.	Bayonet Clasps.	Bayonet-clasp Screws.
Remaining on hand June 30, 1890,										153	151				43	76	35	126	66	12	
Taken up,	76	107	15	15	90	97	16	195	176			149	214	29		150	108				12
Received from Connecticut National Guard,																					
Received from United States Government,																					
Total to be accounted for,	76	107	15	15	90	97	16	195	176	153	151	149	214	29	43	226	143	126	66	12	12
Issued to Connecticut National Guard,																					
Expended,																					
Total issued, expended, dropped, and sold,																					
Remaining on hand, June 30, 1891,	76	107	15	15	90	97	16	195	176	153	151	149	214	29	43	226	143	126	66	12	12

Table 7.

PROPERTY RETURN.

WILLIAM B. RUDD, Quartermaster-General.

CLASS D. QUARTERMASTER'S STORES.

Tools, Implements, and Miscellaneous.

July 1, 1890, to June 30, 1891.	Company Chests.	Augers.	Bit Stocks.	Claw Chisels.	Hammers.	Crow Bars.	Marking Pots.	Stencil Plates, sets.	Padlocks, brass	Padlocks, iron.	Screw Drivers, wood.	Cold Chisels.	Anvils.	Blacksmith Drill.	Blacksmith Forge.	Hoof Knives.	Rasps.	Twist Drills.	Reamers.	Drill Chucks.
Remaining on hand June 30, 1890	3	1	11	1	23	3	2	2	30	2	72									
Received from purchase,					6															
Taken up,				1						10		3	1	1	1	2	3	23	1	1
Total to be accounted for,	3	1	11	-	29	3	2	2	30	12	72	3	1	1	1	2	3	23	1	1
Expended,			10		9				7		10									
Total issued, expended, dropped, and sold,			10		9				7		10									
Remaining on hand June 30, 1891,	3	1	1		20	3	2	2	23	12	62	3	1	1	1	2	3	23	1	1

July 1, 1890, to June 30, 1891.	Sledges.	Branding Iron.	Punches.	Stilson Wrenches.	Monkey Wrenches.	Ice Ax.	Ice Tongs.	Grub Ax	Pliers.	Bench Vises.	Pipe Tongs.	Box Hooks.	Wire Stretcher	Wire Cutters.	Try Square.	Wood Clamps	Shears.	Files.	Tongs.	Buttress.
Remaining on hand June 30, 1890																				
Received from purchase,																				
Taken up,	1	1	6	2	3	1	2	1	2	4	2	6	1	1	1	2	3	5	4	1
Total to be accounted for,	1	1	6	2	3	1	2	1	2	4	2	6	1	1	1	2	3	5	4	1
Expended,																				
Total issued, expended, dropped, and sold,																				
Remaining on hand June 30, 1891,	1	1	6	2	3	1	2	1	2	4	2	6	1	1	1	2	3	5	4	1

July 1, 1890, to June 30, 1891.	Pincers.	Sheep Shears.	Tinner's Shears	Nail Pullers.	Soldering Irons.	Rip Saws.	Cross-Cut Saws.	Hack Saws.	Buck Saws.	Fuse Saws.	Planes.	Lawn Shears	Lawn Mowers.	Turf Cutters	Scythe and Snath.	Sickles	Hardie.	Swage	Sets.	Marlin Spikes.
Remaining on hand June 30, 1890																				
Received from purchase,																				
Taken up,	1	1	1	2	2	2	5	1	1	2	8	1	3	1	1	2	1	1	1	1
Total to be accounted for,	1	1	1	2	2	2	5	1	1	2	8	1	3	1	1	2	1	1	1	1
Expended,																				
Total issued, expended, dropped, and sold,																				
Remaining on hand June 30, 1891,	1	1	1	2	2	2	5	1	1	2	8	1	3	1	1	2	1	1	1	1

July 1, 1890, to June 30, 1891.	Sail Needles.	Palm.	Stone Roller.	Water Tubs.	Copperas Barrels.	Copperas Baskets	Camp Line.	Tape Measure (Camp).	Hose Carriage.	Leather Hose, feet.	Rubber Hose, feet	Hose Reel	Trucks	Platform Scales.	Counter Scales.	Scoops, brass.	Scoops, wood	Oil Cans.	Oil Stoves.	Glue Pots.
Remaining on hand June 30, 1890																				
Received from purchase,																				
Taken up,	6	1	1	21	14	16	2	1	1	150	100	1	3	1	2	1	2	8	4	1
Total to be accounted for,	6	1	1	21	14	16	2	1	1	150	100	1	3	1	2	1	2	8	4	1
Expended,																				
Total issued, expended, dropped, and sold,																				
Remaining on hand June 30, 1891,	6	1	1	21	14	16	2	1	1	150	100	1	3	1	2	1	2	8	4	1

July 1, 1890, to June 30, 1891.	Glue Brushes.	Belt Punches.	Bits, sets	Curb Bits.	Curb Chains.	Hand Cuffs, pairs.	Watering Pots.	Funnels	Faucets.	Measures.	Steel Letters.	Steel Figures.	Moulds for Plaster Shells.	Target Frame.	Business Wagon.	Buggy.	[illegible]	Ladders.	Grain Bins	Hospital Counter.
Remaining on hand June 30, 1890																				
Received from purchase,																				
Taken up,	2	1	1	1	13	2	2	2	2	4	27	6	2	1	1	1		6	3	1
Total to be accounted for,	2	1	1	1	13	2	2	2	2	4	27	9	2	1	1	1		6	3	1
Expended,																				
Total issued, expended, dropped, and sold,																				
Remaining on hand June 30, 1891,	2	1	1	1	13	2	2	2	2	4	27	9	2	1	1	1		6	3	1

July 1, 1890, to June 30, 1891.	Hospital Matting (yards).	Blanket Straps	Soap (cakes)	Candles.	Ink (bottles).	Pens (gross).	Envelopes (1,000).	Pass Books.	Writing Paper (reams).	Lead Pencils (dozens).	Office Desks.	Safes.	Letter Presses.	Typewriter.	Soldier's Headstone (Conn.), sample.	Soldier's Headstone (U. S.), sample.	Hand Grenades.	Stencil Plates, single.	Check Perforator	Stand Lamp.	Hay Press.	Beam Scales.
Remaining on hand June 30, 1890																	23					
Received from purchase,			2880																		1	1
Taken up,	14	3	575	1140	144	3	1750	98	15	120	3	3	2	1	1	1		4	1	1		
Total to be accounted for,	14	3	3455	1140	144	3	1750	98	15	120	3	3	2	1	1	1	23	4	1	1	1	1
Expended,																						
Total issued, expended, dropped, and sold,																						
Remaining on hand June 30, 1891,	14	3	3455	1140	144	3	1750	98	15	120	3	3	2	1	1	1	23	4	1	1	1	1

Table Ware and Kitchen Utensils.

July 1, 1890, to June 30, 1891.	Dinner Plates.	Soup Plates.	Cups and Saucers.	Soup Ladles.	Tumblers.	Water Pitchers.	Vegetable Dishes.	Syrup Pitchers.	Bowls, large.	Sugar Bowls.	Pickle Dishes.	Salt Cellars.	Salt Shaker.	Butter Dishes.	Cream Pitchers.	Cake Dishes.	Cracker Dishes.	Sauce Dishes.	Sauce Bottles.	Casters.
Taken up,	62	63	43	2	46	10	85	6	30	6	6	36	1	36	5	5	6	57	6	6
Total to be accounted for,	62	63	43	2	46	10	85	6	30	6	6	36	1	36	5	5	6	57	6	6
Total issued, expended, dropped, and sold,																				
Remaining on hand, June 30, 1891.	62	63	43	2	46	10	85	6	30	6	6	36	1	36	5	5	6	57	6	6

July 1, 1890, to June 30, 1891.	Napkins.	Basting Spoons.	Tea Spoons.	Table Spoons.	Tin Spoons.	Table Forks.	Table Knives.	Bread Knives.	Butcher Knives.	Meat Knives.	Vegetable Knives.	Kitchen Knives	Chopping Knives.	Chopping Bowls	Meat Saw.	Meat Forks	Meat Chopper	Cleaver.	Skimmer.	Steamers
Taken up,	78	11	36	36	8	36	36	1	3	1	4	5	1	1	1	1	1	1	1	1
Total to be accounted for,	78	11	36	36	8	36	36	1	3	1	4	5	1	1	1	1	1	1	1	1
Total issued, expended, dropped, and sold,																				
Remaining on hand, June 30, 1891.	78	11	36	36	8	36	36	1	3	1	4	5	1	1	1	1	1	1	1	1

July 1, 1890, to June 30, 1891.	Strainers.	Cullenders.	Tea Strainer.	Flour Sieve	Grater	Pie Plates	Trays	Dish Towels	Ranges	Broilers.	Baker	Boilers.	Stove Pipe, feet.	Wash Boilers.	Drip Pans.	Waffle Pans.	Griddle Pans.	Oyster Pans	Bread Pans.	Cake Pans
Taken up,	2	2	1	1	1	76	3	23	1	2	1	1	30	2	3	2	1	2	12	6
Total to be accounted for,	2	2	1	1	1	76	3	23	1	2	1	1	30	2	3	2	1	2	12	6
Total issued, expended, dropped, and sold,																				
Remaining on hand, June 30, 1891.	2	2	1	1	1	76	3	23	1	2	1	1	30	2	3	2	1	2	12	6

July 1, 1890, to June 30, 1891.	Pie Pans.	Milk Pans.	Mixing Pans	Sauce Pans.	Dish Pans.	Frying Pans.	Dust Pans	Iron Pots	Bean Pots.	Coffee Pots.	Tea Pots.	Pot Covers.	Sauce Kettle.	Soup Kettle	Oatmeal Kettle	Egg Beater.	Milk Can	Jelly Tins.	Funnel.	Potato Masher.
Taken up,	12	18	1	5	2	4	1	2	1	1	1	5	1	1	1	1	1	5	1	1
Total to be accounted for,	12	18	1	5	2	4	1	2	1	1	1	5	1	1	1	1	1	5	1	1
Total issued, expended, dropped, and sold,																				
Remaining on hand, June 30, 1891.	12	18	1	5	2	4	1	2	1	1	1	5	1	1	1	1	1	5	1	1

July 1, 1890, to June 30, 1891.	Egg Turner	Cookie Cutter	Lard Pails	Lemon Squeezer.	Potato Fryer	Broilers (hand)	Dippers.	Meat Board	Moulding Board.	Wash Board.	Wash Tubs.	Rolling Pins.	Steel.	Flat Irons.	Water Pails.	Scrub Brushes.	Mops.	Clothes Line.	Clothes Pins (boxes).
Taken up,		1	5	1	1	3	1	1	1	1	3	1	1	3	6	2	1	1	1
Total to be accounted for,		1	5	1	1	3	1	1	1	1	3	1	1	3	6	2	1	1	1
Total issued, expended, dropped, and sold,																			
Remaining on hand, June 30, 1891.		1	5	1	1	3	1	1	1	1	3	1	1	3	6	2	1	1	1

July 1, 1890, to June 30, 1891.	Lanterns.	Coal Hods	Coal Shovels	Pokers.	Table Covers	Ice Boxes	Coal Boxes.	Water Tanks	Soap Dishes	Platters
Taken up,	2	1	1	2	5	1	1	2	30	76
Total to be accounted for,	2	1	1	2	5	1	1	2	30	76
Total issued, expended, dropped, and sold,										
Remaining on hand, June 30, 1891.	2	1	1	2	5	1	1	2	30	76

TABLE 8.

Return of Property in Possession of Connecticut National Guard, June 30, 1891. Infantry.

WILLIAM B. RUDD,
Quartermaster-General.

	Springfield B. L. Rifles, cal. 45	Springfield B. L. R. Bayonets	Peabody B. L. Rifles, cal. 45	Peabody B.-L. R. Bayonets	Cartridge Boxes	Bayonet Scabbards	Waist Belts	Waist Belt Plates	Knapsacks	Drums	Drum Sticks, pairs	Drum Slings	Drum Covers	Uniform Coats	Trousers	Blouses	Helmets	Caps, Fatigue	Overcoats
Brigade.																			
Brigade Headquarters, Bridgeport, Brig. Gen. T. L. Watson	1													[illegible]	[illegible]	3	[illegible]	[illegible]	3
First Regiment.																			
Regimental Headquarters, New Britain, Col. Charles B. Erichson	8						21	21	1					31	31	12	31	10	31
Co. A, Hartford, Capt. Edward Schulze,	62	62			62	65	65	65	65	2	2	2	1	65	65	65	65	65	65
Co. B, Hartford, Capt. John F. Lawler	60	60			61	60	60	58	64	2	2	2	1	63	[illegible]	64	[illegible]	64	65
Co. C, Rockville, Capt. Martin Laubscher	62	62			62	62	64	64	65	2	2	2		65	65	65	65	65	65
Co. D, New Britain, Capt. William J. Allen	62	62			64	61	65	65	64	2	2	2		65	65	65	65	65	65
Co. E, New Britain, Capt. George O. McLean,	63	63			65	65	65	65	65	2	2	2		65	65	65	65	65	65
Co. F, Hartford, Capt. Clarence H. Wickham,	68	69			62	62	65	65	64	2	2	3		65	65	65	65	65	64
Co. G, South Manchester, Capt. Charles L. Bissell,	62	62			62	62	65	61	61	2	2	2		65	65	65	65	65	64
Co. H, Hartford, Capt. Charles H. Patterson,	62	64			65	64	65	63	64	2	2	2		62	65	65	61	56	62
Co. I, New Britain, Capt. Lyman S. Burr,	8		62	62	62	62	65	65		2	2	2	2			64		65	
Co. K, Hartford, Capt. Charles H. Slocum,	63	63			63	63	63	79	64	2	2		1	65	65	64	64	64	63
First Signal Corps, Hartford, Lieut. Howard A. Giddings	9	9			9	9	9	9	9					11	10	11	9	9	9
Total,	589	576	62	62	637	636	675	696	589	20	20	21	6	628	619	665	618	660	616
Second Regiment.																			
Regimental Headquarters, Waterbury, Col. John B. Doherty,	8		3				25	25	5					32	33	33	32	32	32
Co. A, Waterbury, Capt. Charles L. Stocking	8		60	60	64	64	65	65	64	2	3	2		65	65	65	65	65	65
Co. B, New Haven, Capt. John Gott	8		60	60	62	62	65	45	65	2	2	2	2	65	64	65	65	64	65
Co. C, New Haven, Capt. Michael Creed,	8		60	60	60	60	60	60	60	2	2	2	1	65	65	65	63	65	63
Co. D, New Haven, Capt. John Shuster,	8		60	60	62	61	65	64	65	2	2			65	65	65	65	65	65
Co. E, New Haven, Capt. Theodore H. Sucher,	8		60	60	59	59	64	51	65	2	2	2		65	65	65	65	65	65
Co. F, New Haven, Capt. Benjamin F. Brown	8		62	62	62	62	65	65	65	3	2½	[illegible]		65	67	65	65	65	65
Co. G, Waterbury, Capt. Alfred J. Wolff,	8		60	60	62	62	65	64	63	2	2	2		67	68	53	65	65	65
Co. H, Middletown, Captain Wesley U. Pearne,	8		59	59	61	62	65	93	65	2	3	2	2	65	65	65	65	66	65
Co. I, Meriden, Capt. Charles B. Bowen,	8		60	60	60	60	62	62	60	2	3	2		65	65	65	65	65	62
Co. K, Wallingford, Capt. George G. LaBarnes,	8		62	62	62	64	65	65	65	2	2	2	2	65	65	65	65	65	64
Second Signal Corps, New Haven, Lieut. Francis J. Duffy	2		9	9	9	9	9	9	9					9	9	9	9	9	9
Total	90		615	612	623	625	675	669	651	21	23½	19	7	693	696	710	689	691	685
Third Regiment.																			
Regimental Headquarters, New London, Col. George Haven,	8		1				30	30	5	1				30	30	[illegible]		9	31
Co. A, New London, Capt. Michael J. Roach,	8		50	50	52	52	50	[illegible]	55	2	2	2		55	55	[illegible]	54	55	55
Co. B, Pawcatuck, Capt. Daniel Keleher,	8		57	57	59	59	62	62	62	2	2	2		65	62	62	62	65	62
Co. C, Norwich, Capt. Fred. A. Fox	8		60	60	60	60	65	65	65	2	2	2		65	65	65	65	65	65
Co. D, New London, Capt. Thomas O. Thompson,	8		59	57	52	52	54	54	58	2		2		52	47	57	[illegible]	65	57
Co. E, Willimantic, Capt. John H. Morrison,	8		59	61	52	55	55	59	64	2	2	2		58	[illegible]	65	58	58	62
Co. F, Danielsonville, Capt. John Armstrong	8		54	60	59	60	62	58	61	2		1		62	63	61	62	62	65
Co. G, Putnam, Capt. Henry J. Thayer,	8		[illegible]	58	54	54	57	57	60	2	1½	2		[illegible]	[illegible]	59	59	57	57
Co. I, New London, Capt. George W. Metcalf,	8		59	59	[illegible]	59	63	63	60	2	2	2	2	64	64	64	64	61	63
Third Signal Corps, New London, Lieut. Albert C. Ghyser	2		[illegible]	9	9	9	9	9	[illegible]					10	10	10	9	9	9
Total,	74		472	471	456	458	507	507	499	17	15½	15	2	519	516	533	518	509	521
Fourth Regiment.																			
Regimental Headquarters, Winsted, Col. Henry Skinner,	8						45	45	5					[illegible]	31	1	31	[illegible]	31
Co. B, Bridgeport, Capt. Garrie P. Sanger	8		62	62	62	61	65	65	65	2	3	2	2	65	65	65	65	65	65
Co. C, Stamford, Capt. William F. Daniel	8		58	59	60	57	62	64	63	[illegible]	[illegible]	3		62	62	60	[illegible]	65	65
Co. D, South Norwalk, Capt. Russell Frost,	8		61	61	60	60	61	61	64	2	2	2		65	61	62	61	53	65
Co. E, Bridgeport, Capt. James Sheridan	8		62	62	64	64	64	64	62			2	2	[illegible]	[illegible]	[illegible]	60	61	64
Co. F, Norwalk, Capt. Reuben M. Rose,	8		59	59	61	61	63	63	65	2		2	2	65	65	65	65	65	65
Co. G, Danbury, Capt. Carroll D. Ryder,	8		62	62	62	62	65	[illegible]	65	2		2	2	65	65	65	65	65	65
Co. I, West Winsted, Capt. Henry S. Terrell,	8		60	57	53	53	[illegible]	[illegible]	61	2	2			65	62	58	54	62	57
Co. K, Stratford, Capt. George T. Jewell	8		60	60	59	59	60	60	60	2	2	2	2	64	64	64	64	[illegible]	60
Fourth Signal Corps, Bridgeport, Lieut. Owen Burns,	2		9	9	9	[illegible]	9	9	9					[illegible]	9	9	9	9	9
Total,	74		493	491	490	488	550	547	517	17	19	17	10	550	547	539	542	541	540
Separate Companies.																			
First Co., New Haven, Capt. Daniel S. Lathrop,	8		57	58	63	62	60	65	61	2	2	2	1	65	65	65	65	64	65
Second Co., Hartford, Capt. Everett W. Freeman	8		62	62	62	62	63	63	64	2	2	2	2	63	62	64	61	64	64
Total,	16		119	120	125	124	123	128	128	4	4	4	3	128	127	129	126	128	129
Summary.																			
Brigade Headquarters	1													[illegible]	[illegible]	3	[illegible]	[illegible]	3
First Regiment,	589	576	62	62	637	636	675	696	589	20	20	21	6	620	619	665	618	660	616
Second Regiment	90		615	612	623	625	675	669	651	21	23½	19	7	693	696	710	689	691	685
Third Regiment,	74		472	471	456	458	507	507	499	17	15½	15	2	519	516	533	518	509	521
Fourth Regiment,	74		493	491	490	488	550	547	517	17	19	17	10	550	547	539	542	541	540
Separate Companies	16		119	120	125	124	123	128	128	4	4	4	3	128	127	129	126	128	129
Total,	844	576	1761	1756	2331	2331	2530	2547	2384	79	82	76	28	2513	2505	2579	2496	2532	2497

	Sergt.-Major's Chevrons, sets	Q.-M. Sergt's Chevrons, Regtl., sets	Commissary Sergt's Chevrons, sets	Drum Major's Chevrons, sets	Chief Trumpeter's Chevrons, sets	Hospital Steward's Chevrons, sets	First Sergeant's Chevrons, sets	Q. M. Sergt's Chevrons, Co., sets	Sergeant's Chevrons, sets	Corporal's Chevrons, sets	Trumpeter Devices, sets	Signal Service Devices, sets	Arm Brassards	Blankets	Bugles	Cords and Tassels for Bugles	Signal Kits, Company	Gun Slings	Hunter's Hatchets	M. Ball Cartridges, cal. 45, sealed	Arm Chests	Overcoat Cases	Blanket Cases	Cases, Equipment Packing	Wipers, Bristle	Wipers, Wood
Brigade.																										
Brigade Headquarters, Bridgeport, Brig. Gen. T. L. Watson					1				1						1	1										
First Regiment.																										
Regimental Headquarters, New Britain, Col. Charles B. Erichson	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]							5		1											
Co. A, Hartford, Capt. Edward Schulze,							2	2	8	16				56	1	1				500		2	2	1		
Co. B, Hartford, Capt. John F. Lawler							2	2	8	16				62	1					500	[illegible]	3	2			
Co. C, Rockville, Capt. Martin Laubscher							2	2	8	16	2			65	1	1				500	[illegible]		3		7	
Co. D, New Britain, Capt. William J. Allen							2	2	8	16				56	1					500		2				
Co. E, New Britain, Capt. George O. McLean,							2	2	8	16	1			59	1	1				500		2	2			
Co. F, Hartford, Capt. Clarence H. Wickham,							2	2	8	16				48	1					500		2				
Co. G, South Manchester, Capt. Charles L. Bissell,							1	2	8	16				65	1					500	3	2	2	1	6	
Co. H, Hartford, Capt. Charles H. Patterson,							2	1	[illegible]	16	1			56	1	1				500	2	2	2			
Co. I, New Britain, Capt. Lyman S. Burr,							1	1	1	8	1				1	1					4					
Co. K, Hartford, Capt. Charles H. Slocum,							2	2	8	16				52	1	1				500		2				
First Signal Corps, Hartford, Lieut. Howard A. Giddings									2	4		18		9			4	9	1			1				
Total,	2	2	[illegible]	2	2	2	18	18	78	156	9	18	5	532	11	11	4	9	1	4500	20	18	15	2	13	
Second Regiment.																										
Regimental Headquarters, Waterbury, Col. John B. Doherty,	2	2	2	1	2	4							5	11	1	1						1				12
Co. A, Waterbury, Capt. Charles L. Stocking							2	2	8	16	2			65	1	1				500	4	2	2	2		
Co. B, New Haven, Capt. John Gott							2	2	8	16	1			65	1	1				500	4	2	2	1		
Co. C, New Haven, Capt. Michael Creed,							2	2	8	16				60	1	1				500	4	2	2	6		
Co. D, New Haven, Capt. John Shuster,							2	2	8	16	2			65	1	1				500	4	2	2	3		
Co. E, New Haven, Capt. Theodore H. Sucher,							2	2	8	16	1			65	1	1				500	4	2	2			
Co. F, New Haven, Capt. Benjamin F. Brown							2	2	8	16	2			65	1	1				500	4	2	2	2		
Co. G, Waterbury, Capt. Alfred J. Wolff,							2	2	8	16	2			65	1	1				500	3		1	2		
Co. H, Middletown, Captain Wesley U. Pearne,							2	2	8	16				66	1	1				500	4	2	2	3	1	
Co. I, Meriden, Capt. Charles B. Bowen,							2	2	8	16				60	1	1				500	4	2	2			
Co. K, Wallingford, Capt. George G. LaBarnes,							2	2	8	16	2			65	1	1				500	4	2	1	3		
Second Signal Corps, New Haven, Lieut. Francis J. Duffy									2	4		18		9			4		1		1					
Total	2	2	2	1	2	4	20	20	82	164	12	18	5	661	11	11	4		1	5000	41	19	18	22	1	12
Third Regiment.																										
Regimental Headquarters, New London, Col. George Haven,	2	2	2		2	2							5	37								1	1	1		12
Co. A, New London, Capt. Michael J. Roach,							2	2	8	16				55	1	1				500	4	2	1	4		
Co. B, Pawcatuck, Capt. Daniel Keleher,							2	2	8	16				65	1	1				500	4	2	2		7	
Co. C, Norwich, Capt. Fred. A. Fox							2	2	8	16				60	1	1				500	4	2	2	1	6	
Co. D, New London, Capt. Thomas O. Thompson,							2	2	8	16				54	1	1				500	4	2	1			
Co. E, Willimantic, Capt. John H. Morrison,							2	2	8	16				52	1					500	[illegible]	2	1			
Co. F, Danielsonville, Capt. John Armstrong							2	2	8	13	2	2½		59	1	1	1				5	2	1	4	2	
Co. G, Putnam, Capt. Henry J. Thayer,							2	[illegible]	8	14				59						500	4	2	2	1		
Co. I, New London, Capt. George W. Metcalf,							2	2	8	16				65	1	1				500	4	[illegible]	1	2		
Third Signal Corps, New London, Lieut. Albert C. Ghyser									2	4		18		9			4				1					
Total,	2	2	2		2	2	16	16	66	127	2	20½	5	515	9	9	5		1	3500	33	17	12	14	15	12
Fourth Regiment.																										
Regimental Headquarters, Winsted, Col. Henry Skinner,	[illegible]	2		1	2	3							1		1											8
Co. B, Bridgeport, Capt. Garrie P. Sanger							2	2	8	16				65	1					500	4	2	2	4		
Co. C, Stamford, Capt. William F. Daniel							2	[illegible]	8	16				59	1	1				500	4	1	2	5		
Co. D, South Norwalk, Capt. Russell Frost,							2		8	16	1			63	1	1				500	4	2	2	2		
Co. E, Bridgeport, Capt. James Sheridan							2	2	8	16				61	1					500	4		2	3		
Co. F, Norwalk, Capt. Reuben M. Rose,							2	2	8	16	2			63	1					500	4	2	2	4	3	
Co. G, Danbury, Capt. Carroll D. Ryder,							2	2	8	16	1			65	1	1				500	4	2	2	2	[illegible]	
Co. I, West Winsted, Capt. Henry S. Terrell,							2	2	8	16	3			56	1	1				500	4	1		1		
Co. K, Stratford, Capt. George T. Jewell							2	2	8	16				60	1	1				500	5	[illegible]		[illegible]		
Fourth Signal Corps, Bridgeport, Lieut. Owen Burns,									2	4				9			4		1		1					
Total,	2	2	2	1	2	3	16	15	66	132	7		4	509	9	9	4		1	4000	34	14	14	23	20	8
Separate Companies.																										
First Co., New Haven, Capt. Daniel S. Lathrop,							2	2	8	16	1				1	1				500	4	[illegible]				
Second Co., Hartford, Capt. Everett W. Freeman							2	2	8	16	2			2	1	1				500	4			1		
Total,							4	4	16	32	3			2	2	2				1000	8	3		1		
Summary.																										
Brigade Headquarters					2				1						1											
First Regiment,	2	2	2	2	2	2	18	18	78	156	9	18	5	532	11	11	4	9	1	4500	20	18	15	2	13	
Second Regiment	2	2	2	1	2	4	20	20	82	164	12	18	5	661	11	11	4		1	5000	41	19	18	22	1	12
Third Regiment,	2	2	2	3	2	2	16	16	66	127	2	20½	5	515	9	9	5		1	3500	33	17	12	14	15	12
Fourth Regiment,	2	2	2	1	2	3	16	15	66	132	7		4	509	9	9	4		1	4000	34	14	14	23	20	8
Separate Companies							4	4	16	32	3			2	2	2				1000	8	3		1		
Total,	8	8	8	13	[illegible]	11	74	73	309	611	33	56½	19	2219	43	43	17	9	4	18000	136	71	59	62	49	32

	Spring Vises	Tumbler Punches	Target Houses, Wood	Iron Plates, Target Butts	National Colors, complete	State Colors, complete	Marker Flags, complete	Guidons, complete	Color Belts	Color Waist Belts and Plates	Color Covers	Post Flags	N.-C. Staff Swords	N.-C. Staff Sword Belts	N.-C. Staff Sword Belt Plates	Throgs	Sabres	Sabre Belts	Sabre Belt Plates	Music Pouches	Hospital Knapsacks	Surgical Instruments	Leather Cases for Surgical Instruments	Medicine Chests	Camp Desks	Aiming Tripods	Field Glasses	Shell Extractors	Screw Drivers	Horse Equipments, sets	State Rifle Match Prize, Bronze Bust of Gen. Grant	State Rifle Match Prize, Silver Cup	State Rifle Match Prize, Bronze Statuette	Stretchers, U. S. A.	A Tents and Poles, set	Cross Belt Plates	N. C. O. Sword	Acting Hospital Steward's Chevrons, sets	Field Officers' Sabres, U. S.	Chamois Cases for F. O. Sabres	Band Shoulder Belts
Brigade.																																									
Brigade Headquarters, Bridgeport, Brig. Gen. T. L. Watson	1					1						1					3	3							1		1	1	1										10	10	
First Regiment.																																									
Regimental Headquarters, New Britain, Col. Charles B. Erichson			2	6	1	1	4	2	2		2	2	5	5	5	5				20	1	1	1	1	1				1		1			1				2			
Co. A, Hartford, Capt. Edward Schulze,																																									
Co. B, Hartford, Capt. John F. Lawler																																									
Co. C, Rockville, Capt. Martin Laubscher			2	6																																					
Co. D, New Britain, Capt. William J. Allen			1																																						
Co. E, New Britain, Capt. George O. McLean,			1	3																																					
Co. F, Hartford, Capt. Clarence H. Wickham,																																									
Co. G, South Manchester, Capt. Charles L. Bissell,																																									
Co. H, Hartford, Capt. Charles H. Patterson,																																									
Co. I, New Britain, Capt. Lyman S. Burr,																																									
Co. K, Hartford, Capt. Charles H. Slocum,	3	6																																							
First Signal Corps, Hartford, Lieut. Howard A. Giddings																																									
Total,	3	6	6	18	1	1	4	2	2		2	2	5	5	5	5				20	1	1	1	1	1		1		1		1			1				2			
Second Regiment.																																									
Regimental Headquarters, Waterbury, Col. John B. Doherty,				9	1	1	4	6	2	2		2								20	1	1	1		1			5	[illegible]			1		1				2			
Co. A, Waterbury, Capt. Charles L. Stocking																																									
Co. B, New Haven, Capt. John Gott																																									
Co. C, New Haven, Capt. Michael Creed,																																									
Co. D, New Haven, Capt. John Shuster,																																									
Co. E, New Haven, Capt. Theodore H. Sucher,																																									
Co. F, New Haven, Capt. Benjamin F. Brown																																									
Co. G, Waterbury, Capt. Alfred J. Wolff,																																									
Co. H, Middletown, Captain Wesley U. Pearne,			1	[illegible]																																					
Co. I, Meriden, Capt. Charles B. Bowen,			2	6																																					
Co. K, Wallingford, Capt. George G. LaBarnes,	1																																								
Second Signal Corps, New Haven, Lieut. Francis J. Duffy																																									
Total	1		6	21	1	1	4	6	2	2		2								20	1	1	1		1		1	5	9			1		1		2	1	2			
Third Regiment.																																									
Regimental Headquarters, New London, Col. George Haven,	1		2	6	1	1	4	2	2	2	1	1	5	5	5	5				20	1		1		1			11													20
Co. A, New London, Capt. Michael J. Roach,																																									
Co. B, Pawcatuck, Capt. Daniel Keleher,			2	6																																					
Co. C, Norwich, Capt. Fred. A. Fox																																									
Co. D, New London, Capt. Thomas O. Thompson,																																									
Co. E, Willimantic, Capt. John H. Morrison,			2	8																																					
Co. F, Danielsonville, Capt. John Armstrong			1	6																																					
Co. G, Putnam, Capt. Henry J. Thayer,			1																																						
Co. I, New London, Capt. George W. Metcalf,																																									
Third Signal Corps, New London, Lieut. Albert C. Ghyser																																									
Total,	4	8	6	21	1	1	4	2	2	2	1	1	5	5	5	5				20	1	1	1		1	1	1	11	13				1	1				2			20
Fourth Regiment.																																									
Regimental Headquarters, Winsted, Col. Henry Skinner,	1				1	1		2	2		2		5	6	6	5				40	1	1	1		1			8	[illegible]					1				2			[illegible]
Co. B, Bridgeport, Capt. Garrie P. Sanger			2	6																																					
Co. C, Stamford, Capt. William F. Daniel			1																																						
Co. D, South Norwalk, Capt. Russell Frost,			2	6								1																													
Co. E, Bridgeport, Capt. James Sheridan																																									
Co. F, Norwalk, Capt. Reuben M. Rose,																																									
Co. G, Danbury, Capt. Carroll D. Ryder,	1	1		6																																					
Co. I, West Winsted, Capt. Henry S. Terrell,																																									
Co. K, Stratford, Capt. George T. Jewell																																									
Fourth Signal Corps, Bridgeport, Lieut. Owen Burns,																																									
Total,	2	1	7	21	1	1	4	2	2		2	1	5	6	6	5				40	1	1	1		1		1	8	16					1				2			[illegible]
Separate Companies.																																									
First Co., New Haven, Capt. Daniel S. Lathrop,	3	1																											6						1						
Second Co., Hartford, Capt. Everett W. Freeman		2																											[illegible]												
Total,	4	6																											11						1						
Summary.																																									
Brigade Headquarters	1					1						1					3	3	3						1		1	1	1										10	10	
First Regiment,	3	6	6	18	1	1	4	2	2		2	2	5	5	5	5				20	1	1	1	1	1		1		1		1			1				2			
Second Regiment	1		6	21	1	1	4	6	2	2		2								20	1	1	1		1		1	5	9			1		1		2	1	2			
Third Regiment,	4	8	6	21	1	1	4	2	2	2	1	1	5	5	5	5				20	1	1	1		1	1	1	11	13				1	1				2			20
Fourth Regiment,	2	1	7	21	1	1	4	2	2		2	1	5	6	6	5				40	1	1	1		1		1	8	16					1				2			[illegible]
Separate Companies	4	6																											11						1						
Total,	15	21	25	84	4	5	16	12	8	1	5	7	15	16	16	15	3	3	3	100	4	4	4	1	5	1	5	28	51			1	2	4	1	2	1	8	10	10	10

TABLE 9.

Return of Property in Possession of Connecticut National Guard, June 30, 1891.

ARTILLERY AND MACHINE-GUN PLATOON.

WILLIAM B. RUDD, Quartermaster-General.	3-inch Iron Guns, complete.	Gatling Guns, complete.	Sponges.	Sponge Covers.	Sponge Buckets.	Sponges and Rammers.	Watering Buckets.	Tar Buckets.	Lanyards	Priming Wires.	Thumbstalls.	Handspikes.	Prolonges.	Sights.	Poles, extra.	Pole Pads.	Fuze Cutters.	Fuze Wrenches.	Vent Covers.	Tube Pouches and Belts.	Worms and Staves.	Pole Straps.	Gunner's Gimlets.	Gunner's Haversacks.	Gunner's Pincers.	Fuze Saws.	Tompions.	Tow Hooks.	Vent Punches.	Sight Pouches.	Pendulum Sight Pouches.	Pole Yokes.	Paulins.	Ammunition Cases.	Wrenches.	Screw Drivers.	Clamps.	Oil Cups.	Hammers.	Artillery Harness, double sets.	Collars.	Nose Bags.	Whips.	Halters.	Spurs.	McClellan Saddles and Bridles.	Bugles.	Cords and Tassels for Bugles.	Guidons.	Uniform Coats.	Trousers, pairs.	Helmets.	Blouses.	Caps.	Overcoats.	Helmet Plumes.	Helmet Cords.	Chevrons, First Sergt's, sets.	Chevrons, Q. M. Sergt's, sets.	Chevrons, Vet'y Sergt's, sets.	Chevrons, Sergeant's, sets.	Chevrons, Corporal's, sets.	Devices, Trumpeter's, sets.	Sabres.	Sabre Belts and Plates.	Revolvers.	Holsters.	M. Ball Cartridges, cal. 45, sealed.	Dummy Cartridges.	Blankets.	Overcoat Cases.	Blanket Cases.	Packing Cases.	Harness Cases.	Stirrup Straps, extra.	Axes.	Absterdam Shells.	Fuze Gouges.	Fuze Plug Wrenches.	Chevrons, Guidon, sets.	Saddle Cloths.	Devices, Vet. Sergt's, sets.	Saddle Blankets.
Battery A.																																																																																					
Battery Headquarters, Guilford, Capt. Arthur S. Fowler,																																													2½	4			1	4	4	4	4	4	4	4		1	2	2				1	4															1	4	2	
1st Platoon, Guilford, Lieut. William H. Lee,	2		2		2	4	6	4	4	2	2	3	2	4	1	4	2	2	2	4	2	8	4	4	2	2	2	2	2	2			4							8		16	5	16	6½	5	1	1		38	39	38	38	36	38	38					5	8	2	37	28						1		2	4				2	2				19
2d Platoon, Branford, Lieut. James T. Reynolds,	2		3	4	2	4	6	4	4	3	3	4	2	4	2	4		2	2	4	2	8	4	4	2	2		2	2		2		4							8		15	7	15	2	7	1	1		38	32	38	38	39	39	37					2	8	1	39	38						1		4	4			30	2	2				16
Total,	4		5	4	4	8	12	8	8	5	5	7	4	8	3	8	2	4	4	8	4	16	8	8	4	4	2	4	4	2	2		8							16		31	12	31	11	16	2	2	1	80	75	80	80	79	81	79		1	2	2	7	16	3	77	70						2		6	8			30	4	4	1	4	2	35
Machine-Gun Platoons.																																																																																		
1st Platoon, Hartford, Lieut. Henry Avery,		1					1																	4								1	1	50	3	1	1	1		1	4	2	1	2					1	9	11	8	8	8	8	8					2	2		8	8	8	8	4000	250	9		1	1										2
2d Platoon, New Haven, Lieut. William H. Sears,		1					2																	4								1	1	49	5	1		2	1	1	4	2	2	2	1				1	8	16	8	8	8	8	8	8				2	2		8	8	9	9	4000	250						1	1							2
3d Platoon, New London, Lieut. Henry L. Starr,		1					2						1											4								1	1	50	3	2	1	1		1	4	2	1	2	1				1	8	8	8	8	8	8	8	8				2	2		8	8	8	8	4000	210				1										2
4th Platoon, Bridgeport, Lieut. George P. Rand,		1					1						1											4									1	50	3	2	1			1	4	2		4					1	8	16	8	8	8	8	8	8				2	2		8	8	8	8	4000	250				2										4
Total,		4					6						2											16								3	4	199	14	6	3	4	1	4	16	8	4	10	2				4	33	51	32	32	32	32	32	24				8	8		32	32	33	33	16000	960	9		1	4		1	1							10
Total Battery A and Machine-Gun Platoons,	4	4	5	4	4	8	18	8	8	5	5	7	6	8	3	8	2	4	4	8	4	16	8	24	4	4	2	4	4	2	2	3	12	199	14	6	3	4	1	20	16	39	16	41	13	16	2	2	5	113	126	112	112	111	113	111	24	1	2	2	15	24	3	109	102	33	33	16000	960	9	2	1	10	8	1	1	30	4	4	1	4	2	45

TABLE 10.

Return of Property in Possession of Miscellaneous Organizations, June 30, 1891.

WILLIAM B. RUDD,

Quartermaster-General.

	Springfield B.-L. Rifles, cal. 45.	Springfield B.-L. Rifles, cal. 45. Bayonets.	Springfield M.-L. Rifles, cal. 58.	Springfield M.-L. Rifles, cal. 58. Bayonets.	Peabody B.-L. Rifles, cal. 45.	Peabody B.-L. Rifles, Bayonets.	Cartridge Boxes.	Cap Pouches.	Cartridge Box Plates.	Bayonet Scabbards.	Bayonet Scabbard Belts.	Waist Belts.	Waist Belt Plates.	Cross Belt Plates.	Sabres.	Sabre Belts and Plates.
Adjutant-General's Office,																
Total,																
Governor's Guard.																
1st Company Horse, Hartford, Major Frank Cowles,															69	70
2d Company Horse, New Haven, Major Dennis A. Blakeslee,												66	66		73	
1st Company Foot, Hartford, Major John C. Kinney,	112	112														
2d Company Foot, New Haven, Major Joseph J. Wooster,					69	69	69		69	69	69	69	69	69		
Total,	112	112			69	69	69		69	69	69	135	135	69	142	70
Independent Military Organizations.																
Putnam Phalanx, Hartford, Major Joseph Warner,																
Cambridge Guard, Hartford, Capt. Ichabod L. Cambridge,			40	40												
Total,			40	40												
Miscellaneous.																
West Middle School District, Hartford,																
City of New Haven,																
Soldiers' Home, Noroton,																
Total,																
Grand Army of Republic.																
Post No 18, Danbury,																
Post, No. 80, Litchfield,							8			8		8	8			
Post, No. 44, Stafford Springs,																
Total,							8			8		8	8			
Sons of Veterans.																
Camp No. 6, Hartford,																
Camp No. 26, Birmingham,																
Camp No. 7, Meriden,							24	24	24	24						
Camp No. 25, Ansonia,																
Camp No. 16, New Britain,																
Camp No. 41, Lyme,																
Total,							24	24	24	24						
Total Miscellaneous Organizations,	112	112	40	40	69	69	101	24	93	101	69	143	143	69	142	70

	Colt's Revolvers.	Saddles.	Saddle Cloths.	Bridles.	Collars.	Gauntlets, pairs.	Leggings, pairs.	Spurs, pairs.	Shoulder Scales, pairs.	Drums.	Drum Slings.	Drum Sticks, pairs.	Uniform Coats.	Trousers.	Blouses.	Shakos and Pompons.
Adjutant-General's Office,																
Total,																
Governor's Guard.																
1st Company Horse, Hartford, Major Frank Cowles,	67	79	80													
2d Company Horse, New Haven, Major Dennis A. Blakeslee,		75	72	73	71	10	28	17	15				48	48	64	
1st Company Foot, Hartford, Major John C. Kinney,										4	1	3		25		
2d Company Foot, New Haven, Major Joseph J. Wooster,										2			68	67		69
Total,	67	154	152	73	71	10	28	17	15	6	1	3	116	140	64	69
Independent Military Organizations.																
Putnam Phalanx, Hartford, Major Joseph Warner,																
Cambridge Guard, Hartford, Capt. Ichabod L. Cambridge,																
Total,																
Miscellaneous.																
West Middle School District, Hartford,																
City of New Haven,																
Soldiers' Home, Noroton,															200	
Total,															200	
Grand Army of Republic.																
Post No 18, Danbury,																
Post, No. 80, Litchfield,																
Post, No. 44, Stafford Springs,																
Total,																
Sons of Veterans.																
Camp No. 6, Hartford,																
Camp No. 26, Birmingham,																
Camp No. 7, Meriden,																
Camp No. 25, Ansonia,																
Camp No. 16, New Britain,																
Camp No. 41, Lyme,																
Total,																
Total Miscellaneous Organizations,	67	154	152	73	71	10	28	17	15	6	1	3	116	140	264	69

	Helmets.	Caps.	Overcoats.	State Colors, complete.	Epaulettes, sets.	Blankets.	Overcoat Cases.	Blanket Cases.	Pistol Cases.	Chevrons, pairs.	Arm Chests.	Cadet Muskets.	Cadet Musket Bayonets.	6-pdr. Bronze Gun.	Sponges and Rammers.	Worms and Staves.
Adjutant-General's Office,																
Total,																
Governor's Guard.																
1st Company Horse, Hartford, Major Frank Cowles,			82				3		2							
2d Company Horse, New Haven, Major Dennis A. Blakeslee,	27	10								12						
1st Company Foot, Hartford, Major John C. Kinney,			111	1			4									
2d Company Foot, New Haven, Major Joseph J. Wooster,		69	69		67	69	2	1								
Total,	27	79	262	1	67	69	9	1	2	12						
Independent Military Organizations.																
Putnam Phalanx, Hartford, Major Joseph Warner,												100	100			
Cambridge Guard, Hartford, Capt. Ichabod L. Cambridge,											2					
Total,											2	100	100			
Miscellaneous.																
West Middle School District, Hartford,											3	75	74			
City of New Haven,														1	2	2
Soldiers' Home, Noroton,				1										2	4	2
Total,				1							3	75	74	3	6	4
Grand Army of Republic.																
Post No 18, Danbury,											1	11	11			
Post, No. 80, Litchfield,											1	8	8			
Post, No. 44, Stafford Springs,												6	6			
Total,											2	25	25			
Sons of Veterans.																
Camp No. 6, Hartford,												40	40			
Camp No. 26, Birmingham,											1	20	20			
Camp No. 7, Meriden,											1	24	24			
Camp No. 25, Ansonia,											1	26	26			
Camp No. 16, New Britain,											1	20	20			
Camp No. 41, Lyme,											1	20	20			
Total,											5	150	150			
Total Miscellaneous Organizations,	27	79	262	2	67	69	9	1	2	12	12	350	349	3	6	4

	Handspikes.	Prolonges.	Watering Buckets.	Priming Wires.	Paulins.	Wall Tent, Fly, Poles, and Pins, complete.	Helmet Plumes.	Packing Cases.	Lanyards.	6-pdr. Gun Limber.	Camp Desks.	Knapsacks.	Sponge Buckets.	Buff Vests and Trousers, G. F. G.	Ball Cartridges, sealed.	Color Belts.
Adjutant-General's Office,											1					
Total,											1					
Governor's Guard.																
1st Company Horse, Hartford, Major Frank Cowles,																2
2d Company Horse, New Haven, Major Dennis A. Blakeslee,							18									
1st Company Foot, Hartford, Major John C. Kinney,												90		100		
2d Company Foot, New Haven, Major Joseph J. Wooster,								1							500	
Total,							18	1				90		100	500	2
Independent Military Organizations.																
Putnam Phalanx, Hartford, Major Joseph Warner,																
Cambridge Guard, Hartford, Capt. Ichabod L. Cambridge,																
Total,																
Miscellaneous.																
West Middle School District, Hartford,																
City of New Haven,	4	2	1	2	1				1							
Soldiers' Home, Noroton,	4					1				3			2			
Total,	8	2	1	2	1	1			1	3			2			
Grand Army of Republic.																
Post No 18, Danbury,																
Post, No. 80, Litchfield,																
Post, No. 44, Stafford Springs,																
Total,																
Sons of Veterans.																
Camp No. 6, Hartford,																
Camp No. 26, Birmingham,																
Camp No. 7, Meriden,																
Camp No. 25, Ansonia,																
Camp No. 16, New Britain,																
Camp No. 41, Lyme,																
Total,																
Total Miscellaneous Organizations,	8	2	1	2	1	1	18	1	1	3	1	90	2	100	500	2

ANNUAL REPORT

IN RELATION TO THE

Criminal Business of the Courts

OF THE

STATE OF CONNECTICUT,

FOR THE

Year Ending July 1, 1891,

AS SHOWN BY THE RETURNS OF THE STATE ATTORNEYS.

COMPILED BY THE COMPTROLLER.

PRINTED BY ORDER OF THE LEGISLATURE.

HARTFORD, CONN.:
PRESS OF WILEY, WATERMAN & EATON, 354 AND 356 ASYLUM ST.
1891.

State of Connecticut.

STATE OF CONNECTICUT,
COMPTROLLER'S OFFICE,

HARTFORD, December 7, 1891.

To His Excellency, the Governor:

Complying with the statute, I herewith submit the annual reports of the State Attorneys concerning the criminal business of the courts for the year ending July 1, 1891.

The whole number of prosecutions for different crimes was six hundred and twenty-one (621), a decrease of one hundred and twenty-four (124) as compared with the preceding year. Total number of cases disposed of, twelve hundred and twelve (1212), a decrease of two hundred and thirty-eight (238). Total number of convictions, eighty-two (82), a decrease of fifty-two (52) from the preceding year.

The amount of forfeited bonds reported is ten thousand and twenty-five dollars ($10,025). The amount for the preceding year was seventeen thousand and fifty dollars.

Respectfully submitted,

NICHOLAS STAUB,
Comptroller.

REPORTS OF THE STATE ATTORNEYS.

STATE OF CONNECTICUT,
OFFICE OF STATE'S ATTORNEY FOR HARTFORD COUNTY.

To the Comptroller:

SIR:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891.

Total number of cases disposed of during the year,		181

Of these cases 1 was in court for 22 years.
5 were in court for 31 terms.
2 were in court for 19 terms.
1 was in court for 16 terms.
1 was in court for 5 terms.
5 were in court for 3 terms.
19 were in court for 2 terms.
147 were in court for 1 term.

Total number of trials during the year,		10
As to the persons tried, the results were as follows:		
Number of convictions,	9	
Number of acquittals,	0	
Number of cases in which there was disagreement of jury,	1	
Total number of persons tried,		10
Number of pleas of guilty,		111
Bonds forfeited:		
Number,		3
Amount,		$200
Number of *nolles* absolute,		44
Number of *nolles* upon terms,		18
Number of original informations,		79
Appealed cases and their disposition by verdict:		
Number by verdict,		1
Number of pleas of guilty,		45
Number of *nolles* absolute,		21
Number disposed of upon payment or part payment of fine below and cost,		12

Whole number of prosecutions for different crimes,	181
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	2

ARTHUR F. EGGLESTON,

State's Attorney for Hartford County.

NEW HAVEN COUNTY.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	138

Number of terms they were in court:—2 for 19 terms; 1 for 16 terms; 1 for 15 terms; 2 for 10 terms; 1 for 9 terms; 1 for 7 terms; 1 for 6 terms; 6 for 5 terms; 3 for 4 terms; 21 for 2 terms; 99 for 1 term.

Total number of trials and their results:	
Number of convictions,	7
Number of acquittals (three of which are on the sole ground of insanity),	8
Number of cases in which there was disagreement of jury,	1
Number of pleas of guilty,	32
Bonds forfeited:	
Number,	4
Amount,	$2,200
Number of *nolles* absolute,	66
Number of *nolles* upon terms,	9
Number of original informations,	102

Appealed cases and their disposition by verdict:	
Number by verdict,	none.
Number of pleas of guilty,	none.
Number of *nolles* absolute,	12
Number disposed of upon payment or part payment of fine below and cost,	none.

Whole number of prosecutions for different crimes,	125
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	1

TILTON E. DOOLITTLE,

State's Attorney for New Haven County.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	54

Number of terms they were in court:—1 for 19 terms; 1 for 7 terms; 2 for 5 terms; 4 for 3 terms; 6 for 2 terms; 40 for 1 term.

Total number of trials and their results:	
Number of convictions,	1
Number of acquittals,	none.
Number of cases in which there was disagreement of jury,	1
Number of pleas of guilty,	6
Bonds forfeited,	none.
Number of *nolles* absolute,	21
Number of *nolles* upon terms,	25
Number of original informations,	19
Appealed cases and their disposition by verdict:	
Number by verdict,	none.
Number of pleas of guilty,	none.
Number of *nolles* absolute,	11
Number disposed of upon payment or part payment of fine below and cost,	24
Whole number of prosecutions for different crimes,	not given.
Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

Respectfully submitted,

GEORGE E. TERRY,

Assistant State's Attorney for New Haven County, at Waterbury.

Waterbury, June 30, 1891.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	127

Number of terms they were in court,:—63 for 1 term; 35 for 2 terms; 13 for 3 terms; 13 for 4 terms; 3 for 5 terms.

Total number of trials and their results:	
Number of convictions,	5
Number of acquittals,	3
Number of cases in which there was disagreement of jury,	

Number of pleas of guilty,	13
Bonds forfeited:	
Number,	10
Amount,	$1,275
Number of *nolles* absolute,	38
Number of *nolles* upon terms,	52
Number of original informations,	not given.
Appealed cases and their disposition by verdict:	
Number by verdict,	12
Number of pleas of guilty,	13
Number of *nolles* absolute,	38
Number disposed of upon payment or part payment of fine below and cost,	52
Whole number of prosecutions for different crimes,	not given.
Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

Owing to failure of appropriations, only one trial was held after October, 1890, to end of year, July 1st, 1891.

GEORGE M. GUNN,
Pros. Atty. Court of Common Pleas for New Haven County.

NEW LONDON COUNTY.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891—Superior Court:

*Total number of cases disposed of during the year,	58

Number of terms they were in court:—2 for 3 terms; 2 for 2 terms; 54 for 1 term. One case remaining on Docket not disposed of.

Total number of trials and their results:	
Number of convictions,	12
Number of acquittals (one on the sole ground of insanity),	4
No. of cases in which there was disagreement of jury,	1
Number of pleas of guilty,	12
Bonds forfeited:	
Number,	3
Amount,	$800
Number of *nolles* absolute,	6

Number of *nolles* upon terms,	3
Number of original informations,	29
Whole number of prosecutions for different crimes, (including those in which parties pleaded guilty; other than those, 18).	30
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	1

*Sixteen of the 58 cases were sent up for taxation of costs only.

SOLOMON LUCAS,
State's Attorney for New London County.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891.—(Criminal Court of Common Pleas, New London County.)

Total number of cases disposed of during the year,	62

Number of terms they were in court:—2 for 4 terms; 1 for 2 terms; 59 for 1 term.

Total number of trials and their results:	
Number of convictions,	3
Number of acquittals,	none.
Number of cases in which there was disagreement of jury,	none.
Number of pleas of guilty,	5
Bonds forfeited:	
Number,	8
Amount,	$1,450
Number of *nolles* absolute,	12
Number ef *nolles* upon terms,	33
Number of original informations,	7
Number of appealed cases and their disposition by verdict,	not given.

All cases come to this court by appeal.

Whole number of prosecutions for different crimes (including those who pleaded guilty),	8
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	none.

There remain on the Docket 4 cases in which no trials have been had and 2 cases that have been taken to the Supreme Court—six in all.

SOLOMON LUCAS,
State's Attorney for New London County.

FAIRFIELD COUNTY.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	190

Number of terms they were in court:—146 for 1 term; 20 for 2 terms; 8 for 3 terms; 3 for 4 terms: 1 for 5 terms; 3 for 7 terms: 1 for 9 terms; 1 for 10 terms; 2 for 11 terms; 1 for 12 terms; 2 for 24 terms; 1 for 13 terms; 1 for 17 terms.

Total number of trials and their results:	
Number of convictions,	8
Number of acquittals,	7
Number of cases in which there was disagreement of jury,	none.
Number of pleas of guilty,	95
Bonds forfeited:	
Number,	1
Amount,	$150
Number of *nolles* absolute,	72
Number of *nolles* upon terms,	7
Number of original informations,	5
*Appealed cases and their disposition by verdict:	
Number by verdict,	not given.
Number of pleas of guilty,	not given.
Number of *nolles* absolute,	not given.
Number disposed of upon payment or part payment of fine below and cost,	not given.
Whole number of prosecutions for different crimes,	not given.
Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

*All appealed cases are now in Criminal Court of Common Pleas.

SAMUEL FESSENDEN,
State's Attorney for Fairfield County.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	132

Number of terms they were in court:—74 for 1 term; 19 for 2 terms; 16 for 3 terms; 9 for 4 terms; 2 for 5 terms; 4 for 6 terms; 6 for 7 terms; 1 for 9 terms; 1 for 11 terms.

Total number or trials and their results:	
Number of convictions,	16
Number of acquittals,	12
Number of cases in which there was disagreement of jury,	2
Number of pleas of guilty,	26
Bonds forfeited:	
Number,	14
Amount,	$2,050
Number of *nolles* absolute,	35
Number of *nolles* upon terms,	28
Number of original informations,	not given.
Appealed cases and their disposition by verdict,	28
All cases in this court are appealed cases.	
Whole number of prosecutions for different crimes,	not given.
Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

WM. B. GLOVER,

Pros. Atty. Crim. Court of Common Pleas for Fairfield Co.

WINDHAM COUNTY.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	85
Number of terms they were in court:—Average, 1½ terms.	
Total number of trials and their results:	
Number of convictions,	9
Number of acquittals (on the ground of insanity),	1
Number of cases in which there was disagreement of jury,	none.
Number of pleas of guilty,	18
Bonds forfeited:	
Number,	13
Amount,	$1,150
Number of *nolles* absolute,	34

Number of *nolles* upon terms,	none.
Number of original informations,	21

Appealed cases and their disposition by verdict:

Number by verdict,	2
Number of pleas of guilty,	5
Number of *nolles* absolute,	8
Number disposed of upon payment or part payment of fine below and cost,	none.

Whole number of prosecutions for different crimes,	85
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	none.

JOHN J. PENROSE,
State's Attorney for Windham County.

LITCHFIELD COUNTY.

To the Comptroller:

Sir:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	97

Number of terms they were in court:—1 for 12 terms; 4 for 7 terms; 4 for 6 terms; 2 for 5 terms; 1 for 4 terms; 8 for 3 terms; 17 for 2 terms; 60 for 1 term.

Total number of trials and their results:

Number of convictions,	5
Number of acquittals, (and 1 on sole ground of insanity).	1
Number of cases in which there was disagreement of jury,	1

Number of pleas of guilty,	10

Bonds forfeited:

Number,	2
Amount,	$300

Number of *nolles* absolute,	65
Number of *nolles* upon terms,	12
Number of original informations,	36

Appealed cases and their disposition by verdict:

Number by verdict,	1
Number of pleas of guilty,	1
Number of *nolles* absolute,	16

Number disposed of upon payment or part payment of fine below and cost,	7
Whole number of prosecutions for different crimes,	93
Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

JAS. HUNTINGTON,
State's Attorney for Litchfield County.

WOODBURY, CONN., July 15, 1891.

MIDDLESEX COUNTY.

To the Comptroller:

SIR:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891.

Total number of cases disposed of during the year,	66

Number of terms they were in court:—1 for 4 terms; 8 for 3 terms; 16 for 2 terms; 41 for 1 term. 13 continued to September, 1891.

Total number of trials and their results:

Number of convictions,	2
Number of acquittals,	2
Number of cases in which there was disagreement of jury,	none.

One case taken from jury after evidence and before argument, by court, for irregularities of jury.

Number of pleas of guilty,	18

Bonds forfeited:

Number,	1
Amount,	$100
Number of *nolles* absolute,	10
Number of *nolles* upon terms,	23
Number of original informations,	36

Appealed cases and their disposition by verdict:

Number by verdict,	none.
Number of pleas of guilty,	none.
Number of *nolles* absolute,	4
Number disposed of upon payment or part payment of fine below and cost,	20
Whole number of prosecutions for different crimes,	77
Number of second convictions for the same crime,	none.
Number of third convictions for the same crime,	none.

WM. T. ELMER,
State's Attorney for Middlesex County.

TOLLAND COUNTY.

To the Comptroller:

SIR:—Herewith I send you a statement of the business of this office for the year ending July 1st, 1891:

Total number of cases disposed of during the year,	22
Number of terms they were in court,	1
Total number of trials and their results:	
Number of convictions,	5
Number of acquittals,	none.
Number of cases in which there was disagreement of jury,	none.
Number of pleas of guilty,	8
Bonds forfeited:	
Number,	4
Amount,	$350
Number of *nolles* absolute,	1
Number of *nolles* upon terms,	1
Number of original informations,	none.
Appealed cases and their disposition by verdict:	
Number by verdict,	1
Number of pleas of guilty,	3
Number of *nolles* absolute,	none.
Number disposed of upon payment or part payment of fine below and cost,	4

Whole number of prosecutions for different crimes:

1 assault to kill.
1 burglary.
2 larceny.
6 assault and battery.
4 breach of the peace.
1 attempt to rape.
1 breach of game laws.
2 intoxication.
1 barn burning.
1 injury to public buildings.
1 violation of liquor laws.
1 fornication.
—
22

Number of second convictions for the same crime,	not given.
Number of third convictions for the same crime,	not given.

BENEZET H. BILL,
State's Attorney for Tolland County.

SUMMARY.

The following is a summary of the statements of the attorneys for the several counties of the state, as shown by the foregoing returns:

Total number of cases disposed of during the year,	1,212

Number of terms they were in court:—890 for 1 term; 156 for 2 terms; 64 for 3 terms; 32 for 4 terms; 17 for 5 terms; 9 for 6 terms; 15 for 7 terms; 3 for 9 terms; 3 for 10 terms; 3 for 11 terms; 2 for 12 terms; 1 for 13 terms; 1 for 15 terms; 2 for 16 terms; 1 for 17 terms; 5 for 19 terms; 2 for 24 terms; 5 for 31 terms; 1 for 22 years.

Total number of trials and their results:	
Number of convictions,	82
Number of acquittals,	38
No. of cases in which there was disagreement of jury,	11
Number of pleas of guilty,	354
Bonds forfeited:	
Number,	63
Amount,	$10,025
Number of *nolles* absolute,	404
Number of *nolles* upon terms,	211
Number of original informations,	334
Appealed cases and their disposition by verdict:	
Number by verdict,	17
Number of pleas of guilty,	67
Number of *nolles* absolute,	100
Number disposed of upon payment or part payment of fine below and cost,	147
Whole number of prosecutions for different crimes,	621
Number of second convictions for the same crime,	0
Number of third convictions for the same crime,	4

FORTIETH ANNUAL REPORT

OF THE

BOARD OF TRUSTEES

OF THE

Connecticut State Reform School

AT

MERIDEN,

FOR THE FISCAL YEAR ENDING
JUNE 30TH, 1891.

TO

HIS EXCELLENCY, MORGAN G. BULKELEY,
GOVERNOR OF THE STATE OF CONNECTICUT.

MERIDEN:
THE JOURNAL PUBLISHING COMPANY.
1891.

TRUSTEES OF THE STATE REFORM SCHOOL.

Hon. JOHN L. HOUSTON,	Thompsonville,	Hartford County.	Term Expires.............1893.
J. N. STATES,	New Haven,	New Haven County.	Term Expires.............1895.
JOHN K. BUTLER,	Darien,	Fairfield County.	Term Expires.............1893.
ALBURTUS S. BRUCE,	Pomfret,	Windham County.	Term Expires.............1893.
H. HOFFMAN,	New Preston,	Litchfield County.	Term Expires.............1895.
JAS. DONOVAN,	Middletown,	Middlesex County.	Term Expires.............1895.
CHARLES F. SUMNER,	Bolton,	Tolland County.	Term Expires.............1895.
NATHAN D. BATES,	Preston,	New London County.	Term Expires.............1895.

RESIDENT TRUSTEES.

Hon. ISAAC C. LEWIS,	Meriden,	New Haven County.	Term Expires.............1893.
Dr. C. H. S. DAVIS,	Meriden,	New Haven County.	Term Expires.............1895.
D. S. WILLIAMS,	Meriden,	New Haven County.	Term Expires.............1893.
Hon. SETH J. HALL,	Meriden,	New Haven County.	Term Expires.............1895.

OFFICERS OF THE BOARD OF TRUSTEES.

PRESIDENT,

HON. JOHN L. HOUSTON.

SECRETARY,

DR. C. H. S. DAVIS.

TREASURER,

COL. CHARLES L. UPHAM.

EXECUTIVE COMMITTEE,

DR. CHARLES F. SUMNER, D. S. WILLIAMS, J. N. STATES.

AUDITING COMMITTEE,

D. S. WILLIAMS, JAS. DONOVAN.

COMMITTEE ON DISCHARGES,

HON. ISAAC C. LEWIS, GEORGE E. HOWE,
HON. S. T. HALL, DR. C. H. S. DAVIS,
D. S. WILLIAMS, JAS. DONOVAN.

COMMITTEE ON EDUCATION.

A. S. BRUCE, NATHAN D. BATES.

SANITARY COMMITTEE,

DR. C. F. SUMNER, H. HOFFMAN.

MORAL AND RELIGIOUS TRAINING,

H. HOFFMAN, JAS. DONOVAN.

INDUSTRIAL TRAINING,

HON. J. L. HOUSTON, JOHN K. BUTLER,
DR. C. H. S. DAVIS, J. N. STATES.

OFFICERS OF THE SCHOOL.

SUPERINTENDENT,
GEORGE E. HOWE.

MATRON,
Mrs. F. M. HOWE.

BOOK-KEEPER,
G. WORTH HOWE.

TEACHERS IN THE CONGREGATE DEPARTMENT,
Mrs. C. D. SMITH, Mrs. J. S. CRABB, SUSIE COWDERY.

SUPERVISOR OF SOUTH DIVISION,
THOMAS McGUIRE.

SUPERVISOR OF NORTH DIVISION,
J. S. CRABB.

FARMER,
C. D. SMITH.

NIGHT WATCHMAN,
M. H. MARSTON.

COTTAGE A,
Supervisor—JOHN GALLAGHER.
Matron—Mrs. JOHN GALLAGHER.
Teacher—Mrs. M. F. DAYTON.

COTTAGE B,
Supervisor—J. A. SMITH.
Matron—Mrs. J. A. SMITH.
Teacher—Miss GERTRUDE E. DEWEY.

COTTAGE C,
Supervisor—JOHN PARISH.
Matron—Miss MARY I. RAND.
Teacher—Mrs. JOHN PARISH.

COTTAGE D,
Supervisor—F. P. OWEN.
Matron—Mrs F. P. OWEN.
Teacher—Miss A. OWEN.

COTTAGE E,
Supervisor—C. S. FOX.
Matron—Miss C. GREEN.
Teacher—Miss HATTIE E. DAVIS.

STATE OF CONNECTICUT.

REPORT OF THE TRUSTEES

OF

Connecticut State Reform School.

To His Excellency, MORGAN G. BULKELEY, *Governor of the State of Connecticut:*

SIR :—As usual, we, the Trustees of the Connecticut State Reform School, comply with the law and herewith respectfully present our fortieth Annual Report for the year ending June 30, A. D. 1891.

This institution, as a reformatory, since the change from the congregate to the cottage system, shows much greater continuing improvement in its several varied departments, as the five now completed cottages each takes fifty boys from the original congregate building, thus in a measure becoming a graded school, each with its proper officers and teachers and all under the judicious and efficient management and parental care of Mr. and Mrs. George E. Howe.

As quite a change has taken place in the Board of Trustees, by the appointment of new members in the places of those whose term of office expired the present year, it is hoped and confidently expected that the school will be as efficiently and harmoniously managed in the future as in the past. The chapel services on the Sabbath by clergymen of different denominations in the city and other places has an important influence on the character and future condition of the boys.

The accompanying report of Mr. Howe, the Superintendent, contains statements and suggestions, we respectfully ask you to give your candid and careful consideration.

It is hoped the school as a whole, the coming year, will be as healthy as during the past year, and the people of the State, through their representatives and the State officials, will regard the school with favor and give it their liberal support, and with the added blessing of an overruling Providence, great and important will be the results.

Whole number of boys received since School established.....	4,889
Whole number remaining June 30, 1890..................	431
Whole number received during year......................	151
Whole number returned from probation..................	47
Whole number discharged during year....................	195
Whole number left in school June 30, 1891................	434

J. L. HOUSTON,
C. F. SUMNER,
D. S. WILLIAMS,
I. C. LEWIS,
JAMES DONOVAN,
A. S. BRUCE,
NATHAN D. BATES,
JAMES N. STATES,
S. J. HALL,
CHAS. H. S. DAVIS.

MERIDEN, CONN., October 14, 1891.

Sworn to before me, S. J. HALL, *State Senator.*

SUPERINTENDENT'S REPORT.

To the Trustees of the Connecticut State Reform School:

GENTLEMEN:—In conformity with law, I herewith submit my Annual Report for the year ending June 30, 1891.

This being the year that the General Assembly is not expected to meet, and having reported quarterly to your Honorable Board of the condition of the School, I do not deem it necessary at this time to present more than the tabulated statistics of the Institution, which will give the condition of the finances, as well as many other matters of interest.

It is proper for me to say, however, that the year just closed has been fraught with success—probably without a precedent in the history of the School. As our Cottage system is developed, each year shows an increase in efficiency and good results. While we meet with discouragements by seeing some boys apparently but little benefitted, after they pass out of the School, by having been in it, still the great majority give evidence of lasting benefits, and are a credit to the Institution and State that extended a helping hand to them. A few years since a law was enacted providing for an agency to look after discharged boys, but no provision was made for defraying the expenses of said agency. The finances of the institution will not admit of extended visitations, and no doubt we suffer from this cause. Should a competent agent periodically visit the larger cities, to which most of the boys return, for the purpose of looking after their interests, much better results might be expected. When the boys leave the School, they not unfrequently go to localities of undesirable surroundings. An efficient agency would do much towards keeping them under good influences and in proper places.

In our last Annual Report, the subject of an advance of twenty-five cents a week for the board of each inmate was fully discussed.

This increase will be required or special appropriations for repairs, etc., will have to be made to keep the institution in good condition. It will be much pleasanter to have funds sufficient to defray the necessary expense of the Institutions, without going to the Legislature each session to ask for special appropriations.

Many improvements have been made during the year, especially in putting the main or central building in better condition for the purposes for which it is used. A reading-room, to which boys, for meritorious conduct, can be admitted, where they have access to an excellent library, also the opportunity to listen to lectures from time to time, has been properly fitted for the purpose.

The most important improvement of the year has been the erection of a cellar for the storage of garden products, the roots raised upon the farm, and for the storage of salt meats. There being steam in all the buildings it became necessary to provide a place where roots and meats could be kept from the influence of heat. The cellar was erected at a cost of about $1,800, and furnishes storage for 5,000 bushels of roots; also, needed space for meats.

There are some very important repairs that should be made to the institution the present season. Several of the cottages, as well as other buildings, are suffering for want of paint. The concrete pavements in both yards of the congregate department of the School must be repaired this season, or great damage will result from the neglect.

The industries of the School remain about the same as when we last reported. An effort has been made to introduce printing into the School, believing that it would teach the boys a useful trade, by which they might earn a living after leaving the school. Satisfactory progress has not been made in the effort, owing partly to the lack of means to furnish the outfit, and partly for want of a suitable officer to take charge of the enterprise. It is my earnest wish that the way will soon open to the establishment of this important industry.

The prospects for an abundant crop of hay, garden and farm products are not good. The continuous drouth of May and June will materially shorten these crops, and in our opinion the shortage will greatly increase the expenses of the institution. As a rule, heretofore, we have had an abundant supply for the school of farm and garden products.

At the close of the last fiscal year there were 431 boys in the school, and at this time there are 434, showing an increase of three boys over the previous year. There were 629 boys in the school during the year, and of this number 195 were discharged.

Your attention is most respectfully invited to the following tables, which will give in detail many items of interest.

GEO. E. HOWE, *Supt.*

EXHIBIT No. 1.

CLASSIFIED STATEMENT OF EXPENDITURES AND RECEIPTS OF THE CONNECTICUT STATE REFORM SCHOOL, FOR THE YEAR ENDING JUNE 30, 1891.

EXPENDITURES.		RECEIPTS.	
For Farm	$ 754.08	Bal. on hand July 1, 1890	$ 6,232.61
Miscellaneous	466.66	From Farm	383.43
Chapel	106.00	State Treasurer	64,658.15
Traveling	234.20	Miscellaneous	182.07
Postage	99.11	Boarders	287.80
Ret'ning Escapes	34.25	Shoe Shop	2.25
Telephone and Telegraphing	69.83	Insurance	200.00
Hospital	704.01	Chair Shop	5,032.14
Salaries	19,128.67	Provisions	45.33
Heating & Lights	7,644.43	Freight	18.52
Stable	1,692.84		$77,042.30
House Furnishing	2,222.81		
Clothing	4,448.20		
Shoe Shop	1,227.64		
Library & School Books	757.18		
Laundry	574.33		
Green House	9.42		
Stationery	97.45		
Water Rent	899.72		
Insurance	1,740.00		
Chair Shop	47.57		
Provisions	17,923.84		
Repairs	5,774.43		
Freight	337.85		
Cash on hand	10,047.78		
	$77,042.30		

MERIDEN, CONN., Sept. 24, 189

We hereby certify that we have examined the accounts of George E. Howe, Superintendent, and C. L. Upham, Treasurer, of the State Reform School, for the fiscal year ending June 30, 1891; compared the vouchers therewith and found the same correct, and that there was a balance in the hands of the Superintendent amounting to seventeen hundred forty-five dollars and twenty-five cents ($1,745.25), and a balance in the hands of the Treasurer amounting to eight thousand three hundred two dollars and fifty-four cents ($8,302.54).

GEO. F. LINCOLN, } *Auditors of*
D. WARD NORTHROP, } *Public Accounts.*

EXHIBIT No. 2.

SHOWING THE WHOLE NUMBER OF BOYS THAT HAVE BEEN INMATES OF THE SCHOOL SINCE ITS OPENING IN MARCH, 1854.

Whole number since opening,			4889
Number in school July 1, 1890,		431	
From Hartford County,	36		
New Haven County,	74		
Fairfield, "	20		
New London, "	5		
Middlesex, "	2		
Tolland, "	3		
Windham, "	6		
Litchfield, "	4		
Boarders,	1		
Number received on old Commitment,	40		
Number returned themselves,	7	198	
Total,		629	
Discharged in various ways,		195	
Number remaining in School July 1, 1891,		434	

EXHIBIT No. 3.

SHOWING THE AGE OF BOYS AT COMMITMENT.

AGE.	PAST YEAR.	PREVIOUSLY.	TOTAL.
Six,	0	8	8
Seven,	0	31	31
Eight,	0	70	70
Nine,	6	161	167
Ten,	12	485	497
Eleven,	20	540	560
Twelve,	23	718	741
Thirteen,	22	752	774
Fourteen,	21	846	867
Fifteen,	29	831	860
Sixteen,	16	245	261
Seventeen,	2	31	33
Eighteen,	0	15	15
Nineteen,	0	4	4
Twenty,	0	1	1
Total,	151	4738	4889

EXHIBIT No. 4.

SHOWING FOR WHAT OFFENSE COMMITTED.

	PAST YEAR.	PREVIOUSLY.	TOTAL.
Theft,	44	2110	2154
Burglary,	11	219	230
Vagrancy,	6	292	298
Truancy,	5	664	669
Stubbornness,	0	51	51
Obtaining goods on false pretenses,	0	21	21
Arson,	1	35	36
Cruelty to Animals,	0	5	5
Sabbath Breaking,	0	1	1
Malicious Mischief,	5	58	63
Assault,	1	131	132
Assault and Battery,	1	55	56
Breach of the Peace,	0	56	56
Horse Stealing,	0	16	16
Disorderly Conduct,	0	13	13
Robbery,	0	5	5
Trespass,	0	18	18
Manslaughter,	0	1	1
Forgers,	2	4	6
Driving horses without permission,	2	34	36
Lacivious Carriage,	0	3	3
Profane Cursing,	0	4	4
Getting on Cars,	0	3	3
Abusive Language,	0	3	3
Common Drunkard,	0	14	14
Misdemeanor,	2	8	10
Fornication,	0	1	1
Breaking Windows,	0	10	10
Attempt to Kill,	0	1	1
Attempt to Commit Rape,	0	9	9
Rape,	0	3	3
Disobedience,	1	17	18
Placing Obstructions on Railroads,	2	4	6
Receiving Stolen Goods,	0	1	1
Intoxication,	2	12	14
Boarders,	1	165	166
Incorrigibility,	65	691	756
Total,	151	4738	4889

EXHIBIT No. 5.

SHOWING BY WHAT AUTHORITY COMMITTED.

	PAST YEAR.	PREVIOUSLY.	TOTAL.
Hartford Superior Court,	0	39	39
New Haven “	0	73	73
Fairfield “	2	66	68
Litchfield “	0	27	27
Middlesex “	0	10	10
Tolland “	0	15	15
New London “	0	16	16
Windham “	0	7	7
New Haven Common Pleas Court,	0	1	1
Hartford Police Court,	17	581	598
New London “	1	85	86
Norwich “	0	134	134
Waterbury “	11	185	196
New Britain “	2	149	151
Bridgeport “	7	286	293
Meriden “	4	174	178
Stamford “	0	19	19
New Haven “	41	784	825
Norwalk “	0	3	3
Middletown “	0	36	36
Danbury “	0	19	19
Derby “	3	11	14
Wallingford “	0	5	5
Stafford “	1	2	3
Greenwich “	0	2	2
Ansonia “	1	1	2
Rockville “	1	0	1
Birmingham “	1	0	1
Bethany Probate Court,	0	1	1
Justice Court, Various Towns,	58	1842	1900
Boarders,	1	165	166
Total,	151	4738	4889

EXHIBIT No. 6.

SHOWING THE VARIOUS WAYS BY WHICH THE BOYS HAVE LEFT THE INSTITUTION.

	PAST YEAR.	PREVIOUSLY.	TOTAL.
Placed with Farmers, . .	11	491	502
Placed at Various Trades, .	4	49	53
Sentence Expired, . .	0	941	941
Returned to Parents and Friends, .	173	2808	2981
Sent to Deaf and Dumb Asylum, .	0	1	1
Sent to Hospital, . .	0	6	6
Returned to Providence Reform School,	0	5	5
Discharged to go to Sea, . .	1	6	7
“ to Enlist in the Army,	0	26	26
“ to Selectmen, . .	0	1	1
“ for Defective Mittimus,	0	23	23
“ by Order of Court, .	1	16	17
“ by Legislature, .	0	3	3
Remanded to Alternate Sentence,	0	33	33
Released to be tried for Incendiarism,	0	2	2
Escaped and not yet returned, .	2	161	163
Died, . .	2	71	73
Boarders dismissed, . .	1	158	159
Released to be tried for Assault, .	0	2	2
Released to be tried for Burglary,	0	2	2
Sent to Children's Home, .	0	3	3
Total, . .	195	4808	5003

EXHIBIT No. 7.

SHOWING BIRTHPLACE OF THOSE COMMITTED.

Connecticut, ...	90
New York, ...	10
Massachusetts, ...	11
Rhode Island, ...	3
New Hampshire, ...	1
New Jersey, ...	3
Vermont, ...	1

Maine, ...	1
Ohio, ...	1
Virginia, ...	1
Indiana, ...	1
Long Island, ...	1
Canada, ...	1
Ireland, ...	6
Germany, ...	2
Italy, ...	1
England, ...	2
Scotland, ...	1
Sweden, ...	1
Russia, ...	1
Novia Scotia, ...	1
Unknown, ...	11
Total, ...	151

EXHIBIT No. 8.

PARENTAGE OF THOSE COMMITTED.

American, ...	40
Irish, ...	63
German, ...	15
French, ...	10
English, ...	4
Scotch, ...	2
Italian, ...	1
Swede, ...	1
Colored, ...	15
Total, ...	151

FARMER'S REPORT.

To the Superintendent:—

The following tables show the amount of all products grown during the year ending June 30, 1891, and the estimated value of same. Also, an inventory of stock and tools on the farm.

GROWN BY THE FARMER.

70	Tons English Hay,	$1,050.00
22	" Clover Hay,	220.00
5	" Bedding Hay,	50.00
4	" Oat Straw,	32.00
136	Bushels Oats,	102.00
739	" Potatoes,	739.00
5000	Dozen Sweet Corn,	500.00
300	Bushels Cattle Beets,	150.00
36	" Turnips,	70.00
6809	Pounds Pork,	544.72
298	" Leaf Lard,	37.25
152	" Rough Lard,	10.64
2540	" Beef,	101.60
12	Calves,	23.53
28	Pigs,	70.00
39298	Quarts Milk,	2,357.88
2800	Bunches Celery,	80.00
4000	Heads Lettuce,	50.00
3000	Bunches Radishes,	30.00
5	Bushels Peppers,	5.00

GROWN BY J. A. SMITH.

2728	Quarts Strawberries,	341.00
385	" Black Raspberries,	57.75
423	" Red Raspberries,	63.45

820	Quarts Blackberries,	$123.00
672	" Currants,	67.20
223	Bushels Tomatoes,	167.25
5497	Heads Cabbage,	219.88

GROWN BY JOHN GALLAGHER.

42	Bushels Table Beets,	21.00
42	" Egg Turnips,	21.00
30	" Salsify,	15.00
12	" Carrots,	6.00
45	" Parsnips,	25.00
355	" Yellowstone Turnips,	175.00

GROWN BY C. S. FOX.

150	Bushels Snap Beans,	90.00
84	" Lima Beans,	63.00

GROWN BY MR. OWENS.

194½	Bushels Peas,	213.95
30	" Beans,	18.00

GROWN BY MR. PARISH.

240	Bushels Onions,	240.00
2500	Bunches Onions,	62.50

GROWN BY MR. M'GUIRE.

5000	Pounds Squash,	100.00
100	Bushels Cucumbers,	60.00
	Total,	$8,313.60

INVENTORY OF LIVE STOCK.

1	Pair Working Oxen,	$150.00
16	Cows,	640.00
2	Heifers,	40.00
6	Store Hogs,	90.00
20	Shoats,	100.00
6	Horses,	800.00
1	Bull,	30.00
	Total,	$1,850.00

INVENTORY OF TOOLS, CARRIAGES, ETC.

2 Ox Carts,	$75.00
1 Hay Cart,	5.00
2 One-horse Carts,	50.00
1 Deering Mower,	25.00
1 Horse Lawn Mower,	25.00
1 Horse Rake,	15.00
1 Cutaway Harrow,	10.00
1 Spring Tooth Harrow,	25.00
1 Smoothing Harrow,	5.00
1 Iron Roller,	20.00
1 Landslide Plow,	10.00
1 Swivel Plow,	10.00
1 Shovel Plow,	5.00
1 Two-horse Cultivator,	15.00
3 One-horse Cultivators,	20.00
1 Breed's Weeder,	10.00
3 Wheelbarrows,	5.00
1 Horse Sled,	5.00
1 Ox Sled,	5.00
1 Seed Drill,	2.50
6 Hay Rakes,	1.50
9 Garden Rakes,	3.00
6 Hay Forks,	1.50
16 Manure Forks,	4.00
16 Shovels,	10.00
15 Spading Shovels,	5.00
20 Spading Forks,	10.00
1 Root Cutter,	5.00
1 Hay Cutter,	5.00
2 Yokes,	5.00
3 Chains,	3.00
1 Potato Digger,	5.00
10 Picks,	5.00
2 Platform Scales,	10.00
10 Axes,	5.00
100 Hoes,	20.00
2 Crowbars,	3.00
13 Baskets,	2.00

5 Scythes and Snathes,	$ 5.00
1 Stone Boat,	5.00
2 Grind Stones,	3.00
6 Hand Lawn Mowers,	40.00
1 Top Buggy,	200.00
1 Phaeton,	50.00
1 Three-seated Carryall,	100.00
2 Two-seated Carriages,	300.00
1 Surry,	150.00
2 Express Wagons,	50.00
1 Chair Wagon,	150.00
1 Lumber Wagon,	25.00
1 Chair Sleigh,	25.00
1 Two-seated Sleigh,	25.00
2 Single Sleighs,	25.00
4 Single Harness,	40.00
1 Set Light Harness,	25.00
2 Sets Double Harness,	75.00
Total,	$1,738.50

C. D. SMITH, *Farmer.*

SCHOOL REPORT.

Number of boys under instruction July 1, 1890,	431
Number received during the year,	198
Whole number under instruction during the year,	629
Number discharged during the year,	195
Present number under instruction,	434

The scholarship of the boys when received is shown by the following statements:

READING.

Who did not know the alphabet,	42
Who could read in first reader,	34
Who could read in second reader,	83
Who could read in third reader,	126
Who could read in fourth reader,	149
	434

WRITING.

Who could not write at all,	57
Who could write easy words,	146
Who could write letters to friends,	231
	434

ARITHMETIC.

Who knew nothing of arithmetic,	89
Who had studied mental arithmetic,	207
Who ciphered through simple rules,	138
	434

GEOGRAPHY.

Who had never studied geography,	165
Who had studied geography,	269
	434

The following statement shows the proficiency of the boys in the several branches taught in the schools:

Who read in fourth reader,	160
Who read in third reader,	184
Who read in second reader,	72
Who read in first reader,	18
	434

WRITING.

Who can write letters to friends,	368
Who can write easy words,	43
Who can print reading lessons,	23
	434

ARITHMETIC.

Who have studied common fractions,	70
Who have studied in properties of numbers,	27
Who have studied in compound numbers,	59
Who have studied in simple rules,	127
Who have studied in mental arithmetic,	151
	434

GEOGRAPHY.

Who have studied Swinton's complete geography,	112
Who have studied Swinton's elementary geography,	215
Who do not study geography,	107
	434

HISTORY.

Who have studied United States history,	138

THE SCHOOL AND ITS METHODS.

The following description of the School and its methods is copied mainly from our last Annual Report:

The Connecticut State Reform School for delinquent and wayward boys is beautifully located upon a high elevation of land in the city of Meriden, a thriving manufacturing city, with a population of 30,000 inhabitants, situated on the New York, New Haven & Hartford Railway, midway between the cities of Hartford and New Haven. The buildings of the Institution are less than half a mile from the center of the city, and are only ten minutes walk from the railroad depot.

The farm belonging to the Institution lies in the rear of the buildings, and contains one hundred and ninety-five acres of land, one hundred acres of which are comparatively level, and well adapted to the raising of small fruits and garden vegetables, for which purposes it has already been largely appropriated. The balance of the land is somewhat broken, a portion being covered with a thick growth of small timber, while the remainder furnishes good pasturage for the stock. A living stream of pure water runs through the farm near its center.

The buildings of the Institution are mostly of brick, and are well constructed. They consist of one central building, five cottage buildings, a church edifice, a large boiler and coal house, a conservatory, a bake house, a large hay and cow barn, a horse barn and carriage sheds, cattle sheds, hennery, piggery, wood house, etc.

The main, or central building, fronts the east, is 300 feet long by 50 deep, the central portion being four stories high above the basement, the wings on either side being three stories high. Attached to the rear of the main building, on the west, is also a wing 120 feet long by 40 feet wide, which is three stories high above the basement. In the basement story of the main building are located the kitchen, laundry, engine room, six store rooms, milk room, two large play rooms, two bath rooms and two rooms for storage of coal. The kitchen is furnished with three large steam kettles for cooking purposes, the steam being supplied from the boilers at the boiler house. There is also a six-horse power vertical boiler in the kitchen, to be used in case of an accident to the other boilers, and on Sundays when the large boilers are not in use.

The bakery and bread room are conveniently connected with the kitchen, and are under the same supervision.

The laundry is supplied with three of the Nonpareil washing machines of the largest size, and a large mangle. The accommodations for drying clothes by steam are ample. There are also conveniences for making starch and for preparing soap for the machines by steam.

The engine room contains a boiler of 25-horse power, and an engine of 15-horse power. The power is used in running the machinery of the laundry; also for running 125 sewing machines.

There are two play rooms, one for each division of the School, which are nicely furnished with settees sufficient to seat all of the boys, and the rooms are pleasantly decorated with pictures and paintings of various kinds, and are very well supplied with newspapers and magazines. These rooms furnish a pleasant place for boys who desire to spend a portion of their play time in reading or in innocent games.

The bath rooms are supplied with a plunge and shower bath. By the aid of steam the shower can be made of any desired temperature. The accommodations are so ample that all of the boys can be thoroughly bathed in thirty minutes. The rooms are well provided with looking glasses, combs and brushes, and pleasant conveniences for obtaining cool drinking water at all times.

The first story of the main building above the basement contains one general office, a private office for the Superintendent, one reception room, a library room, four large school rooms with a seating capacity of one hundred boys each, one recitation room, two large wardrobe rooms for boys' Sunday clothing, one officers' sitting room, private dining room and kitchen for the Superintendent's family, large dining room and kitchen for the officers of the Institution, two large dining rooms with a seating capacity for 375 boys, together with numerous closets, pantries, halls, etc.

The second story contains parlors and sitting room, bed chambers and closets for Superintendent's family, six rooms for officers, four large shop rooms and two sleeping halls. The shop rooms are in the rear wing, and are used for the manufacture of shirts. One hundred and twenty-five sewing machines, run by steam, are used in these manufacturing rooms.

The sleeping halls have a capacity for comfortably lodging 375 boys. The halls extend to the top of the building, and are sufficiently high to admit of two corridors above the main floor. The halls are light and pleasant, with good ventilation. They are furnished with single bedsteads, good mattresses, feather pillows, and plenty of bedding adapted to the season. The halls are also provided with six night closets, conveniently located, and with hydrants, from which good drinking water can be obtained at all times. A night watchman looks carefully after the wants of the boys during sleeping hours.

The third story, in the center and end wings, contains fifteen rooms, which are used for guest chambers and sleeping rooms for officers of the Institution. In the rear wing of this story, there is a large shop, where 100 boys labor at cane-seating chairs, and a band room.

The fourth story of the central portion of the building is used for hospital purposes, with rooms for the nurses, etc. The hospital contains nine wards, and is provided with hot and cold water, and all conveniences necessary for making the sick comfortable.

In the rear of the main building there are two yards, surrounded by a high fence, in which the boys have ample time for exercise and play. There is also a yard of three acres of ground, containing a pleasant grove of chestnut and oak trees, surrounded by a neat picket fence, five feet high, where the boys are often permitted to play, and where, in the summer time, they enjoy their holiday sports. The grounds surrounding the buildings are tastefully laid out, and are well set with ornamental shrubs and flowers. The boys in the main building, or Congregate Department of the School, number about 200.

Five cottages have recently been built, that very comfortably accommodate fifty boys each. They are built of brick, are three stories high above the basement, and cost about $16,000 each. The basement contains a large play room, a room for storage, two bath rooms, and a fruit cellar. All the basement rooms are well lighted and warmed, where heat is needed.

The first story contains a large school room, handsomely seated and furnished, officers' private rooms, a bath room, reception room, two dining rooms, a kitchen and pantry, and two halls.

The second story contains a sleeping hall for twenty boys, a hospital room, a teachers' room, a bath room, a room for boys' Sunday clothing, a store room for bedding, etc., and a large shop room.

The third story contains a sleeping room for thirty boys, a bath room, and a store room for bedding.

The buildings are finished in hard wood, are well furnished in every department, are lighted with gas, supplied with water from the city reservoir, and warmed by steam.

The buildings differ, architecturally, in their outside appearance, but are substantially the same in their interior arrangements. Each cottage is supervised by a gentleman and his wife, and one lady teacher. They are conducted on what is known as the Open, or Family plan, the boys being held in their places by kindness and home influences, instead of the more arbitrary appliances of bolts, bars and high fences.

The chapel edifice is a beautiful structure, with a seating capacity of 500 boys. It contains a large platform, with convenient side rooms, which afford excellent facilities for giving concerts and other appropriate entertainments. A grand piano stands upon the platform. The chapel was erected at a cost of about $15,000.

The boiler house is a solid structure of brick and stone work, 35 by 57 feet, and is two stories high. The lower story is 18 feet high, and contains a room for three boilers of 60-horse power each, and a coal room that furnishes storage for 300 tons of coal. The boiler room contains a receiving tank, force pump and all apparatus necessary to supply all the buildings with steam sufficient to warm them well, and in the most approved manner, and to drive the machinery in the laundry and in the manufacturing department. The chimney stack is 80 feet high, and gives an excellent draught in all kinds of weather. The upper story of the building contains a shoe shop and living room for the engineer.

The farm buildings are commodious, and afford storage room for all the carriages and smaller implements necessary for the farm and for the use of the Institution. The main barn is 83 feet in length by 42 feet in width, and is three stories high. The lower, or ground floor, is used as a manure cellar and for storing the winter supply of vegetables, the two being separated by a heavy cemented wall of stone. The capacity of these is about forty cords of manure and 2,000 bushels of vegetables. The middle story contains the stabling, running the entire length, arranged for the comfort and cleanliness of the stock, two rooms for such animals as need seclusion, a bedding room and bays for hay, which extend through the upper story to a height of 25 feet. The third story contains the driving floor, where the hay and other fodder, as well as the grain, are all drawn and stored; a feed room and rooms for the. smaller farm tools. Above the floor is a large space for grain or hay. The building is capable of storing seventy tons of hay, and is in all respects a model of convenience and economy of labor. Connected with this building by a carriage shed, is a horse barn, 30 feet in length by 24 feet in width, conveniently divided into stabling, a harness room, and a lodging room for the hostler, while above these is ample room for bedding, hay and other feed. There is also attached to the main barn a shed, 54 feet by 20 feet, which furnishes additional stalls for cattle, as well as protection for the spring water with which the stock is supplied, and for the more bulky farm implements. Another building near these, 32 feet by 20 feet, is used also for storing farm implements.

The piggery stands about 500 feet from the main, or school building, and consists of a brick front, 34 feet by 20 feet, in which the cooking for the swine is done, and also the slaughtering of the pork. Extending from this is a wooden building, 65 feet by 12 feet, where the swine are kept. This is divided by movable partitions into eight pens, or less, if desired, and is arranged with special reference to the comfort of the animals, and ease and convenience in their care.

The neat stock kept upon the farm includes sixteen milch cows, two heifers, and one pair of working oxen. None of these are full blooded, but are, with a single exception, Jersey or Ayrshire grades, and were nearly all raised upon the farm. No animals of this class are kept after they become unprofitable from old age, or failure of any kind, but are always converted into beef and sold. The service of five horses is required for freighting, driving and farm work. The swine kept are nearly all Berkshire grades, and vary in number from twenty to forty. Very little grain is fed to them, as the number kept depends upon the amount of feed supplied by the Institution.

WATER SUPPLY.

The Institution is supplied with water from two sources. The water of a never-failing spring, one mile and a quarter away, owned by the Institution, is conducted by a three-inch pipe to the buildings, and furnishes sufficient for cooking and drinking purposes; also all needed water for the barns and piggery, and for irrigation at various points upon the farm. For the boilers, laundry, closets, and all general purposes, the supply is obtained from the city water works. The pressure of this water is about eighty-five pounds, and is sufficient to force the water to any part of the buildings in case of fire. The Institution has three convenient hydrants and hose, that may be used should the necessity for their use ever occur.

GAS.

The Institution is supplied with gas from the city gas works.

INDUSTRIES.

There are six shops in the Institution that give employment to over 400 boys. In the tailor shop, where the clothing worn by the boys is made and repaired, twenty boys are employed. About 225 boys work at cane-seating chairs in two different shops. A shoe shop gives employment to a small class. The farm and garden, in the summer time, call for a class of from thirty to forty boys; in the winter, a small class cares for the stock and does the necessary work about the premises. From eight to ten boys work at the greenhouse and on the lawns. The laundry, dining rooms, kitchen, sleeping halls, etc., all require classes from six to ten to boys each.

FOOD.

The dietary of the Institution, while it does not embrace the variety ordinarily found on the tables of well-to-do people, still, the quality of the food daily placed before the boys could be no better. The bread is made from a good grade of white floor, the meats used are of the best quality, and the vegetables are supplied abundantly from the Institution gardens, and embrace a full variety of such kinds as are found in the best market gardens. Coffee is furnished for breakfast and supper, in which all the milk from the Institution dairy is used, averaging from 100 to 200 quarts daily. Once a week a bountiful dinner of fish or fish chowder is given. The tables are supplied daily with butter or molasses, and, on Sunday, pies are given at dinner and cakes for supper. On Thanksgiving day a bountiful turkey dinner is furnished, and, on all other holidays, the tables are spread with all the delicacies of the season. The boys are allowed all they want to eat at every meal, and no boy need ever leave the table hungry. The deprivation or a change of food is never allowed as a punishment. The tables are nicely covered with white oil cloth, and are spread with white porcelain ware, silver plated knives and forks, spoons and casters. Good manners are taught and required at meal time.

CLOTHING.

The boys of the Institution are clothed in the best quality of all-wool gray cloth for pantaloons, and dark indigo blue army goods for jackets. Heavy Amoskeag Hickory is used for shirting; their caps are made to order from all-wool blue cloth, and their shoes and stockings are of good quality. They dress in summer in lighter goods, according to the season.

RECREATION.

All holidays are devoted entirely to recreation and play. Portions of each week day, that will equal at least two hours of time, are also given for play. On Saturday afternoon, when the weather is suitable, the boys go to the ball grounds, in an open field of many acres, where they enjoy full freedom in playing ball or such games as may suit their tastes best. Many opportunities are given to attend appropriate amusements at the Opera House in the city, and frequent rehearsals, concerts and exhibitions are given for the benefit of the boys in our own chapel. They attend the Agricultural Fairs given in the park near by, and always take part in the ceremonies on the day devoted to the decoration of the soldiers' graves.

RELIGIOUS AND MORAL INSTRUCTION.

Two services are held in the chapel each Sabbath; Sabbath school in the morning and preaching in the afternoon.

The "International Lesson Leaves" are used in the Sunday school. These lessons, with the explanation, prayers, responsive exercises and music, make a very interesting and profitable service.

The ministers from the several churches of the city preach in their turn at the Sunday afternoon service.

The Sisters of Mercy instruct the Catholic boys of the School an hour each Sabbath.

Devotional exercises are held morning and evening each day of the week, and grace is said before all meals.

There is a moral review every evening, at which time a record is made in a book, kept for the purpose, of every boy's conduct during that day. These records determine a boy's standing in the School at all times.

SCHOOL.

All the boys attend school three hours each week day, ten months in the year. The schools embrace ten grades or divisions, which give every boy the opportunity to attend a class exactly adapted to his scholarship, and, as a rule, substantial and praiseworthy progress is made in study. Much attention is given to the subjects of reading, writing, spelling and arithmetic. Any boy, with an average mind, can, while at school, obtain an education that will fit him to transact the ordinary business of life.

MUSIC.

Much attention is given to music, both vocal and instrumental. All the boys are taught vocal music, and about thirty boys are under constant training in instrumental or band music. Great proficiency is made in both departments.

SENTENCES.

Boys between the ages of seven and sixteen years can be sent to the school during the minority by any court of record in the State. Parents or guardians may secure the admission of their sons or wards without process, by paying $3 per week quarterly, and in advance, for their board.

DISCHARGES.

Boys are dismissed on probation after they obtain the "Honor Grade," and this grade, by uniform good conduct, can be attained in one year after entering the School. By indifferent or bad conduct, promotions are lost, and, as a result, the time for a boy to remain in the School is lengthened.

All boys that go out on leave of absence are required to communicate with the Institution once in six months, and by failing to do so, they are at once looked after by the authorities of the School. A record is kept, as far as is possible, of every boy's conduct after he leaves the Institution.

The Board of Trustees has discretionary power to dismiss any boy from the Institution whenever the interests of the School or the boy will be promoted by such dismissal.

NAMES, RESIDENCES, COMMISSION AND RETIREMENT OF THE TRUSTEES OF THE STATE REFORM SCHOOL, FROM ITS COMMENCEMENT TO THE PRESENT TIME.

Date of Commission.			Date of Retirement.
1851	Gideon Wells,	Hartford,	1853
1851	Phileman Hoadley,	New Haven,	1857
1851	E. S. Abernethy,	Bridgeport,	1853
1851	A. N. Baldwin,	West Milford,	1855
1851	Philo M. Jackson,	Norwich,	declined
1851	Erastus Lester,	Plainfield,	1854
1851	Henry D. Smith,	Middletown,	1853
1851	John H. Brockway,	Ellington,	1852
1853	Philip Ripley,	Hartford, died in office,	1863
1853	David Patchen,	Weston,	1854
1853	John P. Gulliver,	Norwich,	1854
1853	John S. Yeomans,	Columbia,	1856
1853	James Phelps,	Essex,	1855
1854	Fred S. Wildman,	Danbury,	1858
1854	Moses Pierce,	Norwich,	1856
1854	John Gallup, (2d)	Brooklyn,	1858
1855	Sylvester Spencer,	Litchfield, resigned,	1858
1855	Elihu Spencer,	Middletown,	declined
1856	Moses Culver,	Middletown,	1858
1856	Thomas Clark,	Coventry,	1860
1856	W. P. Benjamin,	New London,	1876
1857	W. S. Charnley,	New Haven,	declined
1858	E. W. Hatch,	Meriden, resigned,	1859
1858	Horace Gaylord,	Ashford,	1862
1858	David P. Nichols,	Danbury,	1875
1858	Thomas A. Miller,	Torrington,	1859
1858	Benjamin Douglass,	Middletown,	1876
1859	Hiram Foster,	Meriden,	1873
1859	Daniel G. Platt,	Washington, died in office	1871

Date of Commission.			Date of Retirement.
1859	Henry McCray,	Ellington,	1876
1862	Roswell Brown,	Hartford, died in office,	1877
1862	William Swift,	Windham,	1866
1863	Henry B. Hubbard,	Middletown,	declined
1866	James B. Whitcomb,	Brooklyn,	1874
1871	George Langdon,	Plymouth,	1875
1873	Hiram A. Yale,	Meriden,	1877
1874	S. B. Cocks,	Huntington, resigned,	1876
1874	F. O. Bennett,	Willimantic, retired,	1882
1875	Delos H. Stevens,	Barkhamstead, retired,	1889
1875	Chas. Fitzgerald,	Middletown, retired,	1891
1875	Edward W. Seymour,	Litchfield, retired,	1876
1875	Goodwin Collier,	Hartford, retired,	1876
1875	Charles L. English,	New Haven,	resigned
1876	John M. Brewer,	Norwich, died in office,	1878
1876	G. H. Preston, M. D.,	Tolland, “ “	1883
1877	Vincent Colyer,	Darien, retired,	1886
1877	John L. Houston,	Thompsonville,	still in office
1878	A. P. Willoughby,	Norwich, retired,	1879
1879	Charles Fabrique,	New Haven, died in office	1889
1879	J. S. Lathrop,	Norwich, retired,	1891
1879	Theodore Bird,	Bethlehem, retired,	1891
1882,	Albertus S. Bruce,	Pomfret,	still in office
1883,	Charles F. Sumner,	Bolton,	“ “
1886,	John K. Butler,	Darien,	“ “
1889,	James N. States,	New Haven,	“ “
	RESIDENT TRUSTEES.		
1877,	Isaac C. Lewis,	Meriden,	still in office
1877,	Charles L. Upham,	“ retired,	1891
1877,	Owen B. Arnold,	“ “	1891
1887,	D. S. Williams,	“	still in office
1891,	Seth J. Hall,	“	“ “
1891,	C. H. S. Davis,	“	“ “
1891,	Herman Hoffman,	New Preston,	“ “
1891,	Nathan D. Bates,	Preston,	“ “

NAMES OF SUPERINTENDENTS

OF

CONNECTICUT STATE REFORM SCHOOL.

Date of Appointment.	NAMES.	Date of Retirement.
1853	PHILIMON HOADLEY, . . .	1855
1854	SAXTON B. LITTLE, Ass't Supt., . .	1875
1855	ROSWELL HAWLEY, M. D., . .	1859
1858	EDWARD W. HATCH, M. D.,	Died Feb. 7, 1874
1874	SAXTON B. LITTLE, Acting Supt.,	July 1, 1874
1874	EDWARD INGHAM, . . .	July 1, 1876
1876	S. B. COCKS, . . .	Dec. 1, 1877
1877	J. W. BROWN, Acting Supt., .	April 23, 1878
1878	GEO. E. HOWE, . . .	still in office.

FORM OF INDENTURE ADOPTED BY THE TRUSTEES.

To the Trustees of the Connecticut State Reform School:

I hereby request that the boy named

received as indentured, according to the law, to the STATE REFORM SCHOOL, at MERIDEN, and I hereby bind myself and agree to the following conditions, viz:

The price of board, education, training and clothing for said boy shall be at the rate of THREE DOLLARS per week, payable quarterly, in advance, and the said

is bound to remain in the Institution for the term of months, entitled to the same supervision, medical treatment, support and education, and subject to the same regulations, employment and restraint as all other inmates of said School.

[SIGNED]

CIRCULAR OF
INFORMATION TO PARENTS AND GUARDIANS.

We take this method of informing you that your was this day duly received at this Institution, here to remain during his minority, or until otherwise discharged in accordance with the rules of the School. Any boy, by uniform good conduct, can reach his "Honor Grade" in one year from the time he enters the School. He is then given a probationary discharge to go to his home, where he will be permitted to remain as long as he does well. If his conduct in the School is not good, the time for his receiving his probationary discharge will be increased. For your further information, it is proper to state that the Institution is not a prison, but a School for detention and reform, where the inmates receive such instruction and training as are best adapted to form and perpetuate a virtuous character, to establish habits of industry, and to advance them in those branches of knowledge which are taught in the Common Schools of the State. They are here provided with a home in every way pleasant and comfortable, are furnished with steady employment, of a kind that will aid them in earning an honest living after they leave the School. They have appropriate seasons for recreation and play, are well fed and clothed, and, when sick, have the best of care and medical attendance. They attend school regularly six days of the week, are taught by efficient and experienced teachers, and on Sunday enjoy the privileges of the Sabbath school and one regular Chapel service, over which some minister of the Gospel from one of the city churches presides. The Catholic boys of the School receive one hour of instruction each Sabbath from the Sisters of Mercy.

In order to accomplish the wise ends for which this Institution was established, to wit; the reformation of boys intrusted to its care, it will be necessary for them to remain in School for a sufficient length of time to receive such training and discipline as will serve to reform their evil ways, and to establish in them correct moral principles and habits of industry.

Applications for the discharge of boys from the Institution are frequently made in a short time after their commitment, but of course these applications are not entertained. Experience has taught the management that the best interests of the School are promoted by treating the boys all alike, and by requiring all to procure their "Honor Badge" before leaving the School. If there is a deviation from the rule in a *single* case, every other boy has the *right* to ask for the same deviation in *his* case, and the Institution would soon lose its reformatory character.

Parents, guardians and other near friends are permitted to visit the boys on the first Wednesday of each month, at which time no pains will be spared in giving all information sought for in relation to the standing of any boy in the School.

The boys are permitted to write to their friends once a month, and the friends are allowed to write to the boys at their pleasure. In case of the serious illness of any boy, his friends will at once be advised of his condition.

AMENDMENTS TO LAW

RELATING TO THE REFORM SCHOOL, MERIDEN.

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. Whenever any boy under the age of sixteen years shall be convicted of any crime or misdemeanor, punishable by fine or imprisonment other than imprisonment for life, the Court or Justice of the Peace, as the case may be, may commit him to the Reform School, to remain until he shall arrive at the age of twenty-one years, unless sooner discharged by the Board of Trustees. And the Judges of the Criminal and Police Courts of the State, and Justices of the Peace, shall have power to commit to the Reform School: First, any boy under sixteen years of age who may be liable to punishment by imprisonment under any existing law of the State, or any law that may be enacted and in force in the State; second, any boy under sixteen years of age, with the consent of his parents or guardian, against whom any charge of committing any crime or misdemeanor shall have been made, the punishment of which, on conviction, would be confinement in jail or prison; third, any boy under sixteen years of age, who is destitute of a suitable home and adequate means of obtaining an honest living, or who is in danger of being brought up, or is brought up, to lead an idle or vicious life; fourth, any boy under sixteen years of age, who is incorrigible, or habitually disregards the commands of his father or mother or guardian, who leads a vagrant life, or resorts to immoral places or practices, or neglects or refuses to perform labor suitable to his years and condition, or to attend school.

Sec. 2. That every boy sent to the Reform School shall remain until he is twenty-one years of age, unless sooner discharged or bound as an apprentice; but no boy shall be retained after the Superintendent shall have reported him fully reformed.

Sec. 3. That whenever there shall be as large a number of boys in the School as can be properly accommodated, it shall be the duty of the President of the Board of Trustees to give notice to the Criminal and Police Courts of the fact, whereupon no boys shall be sent to the School by said Courts until notice shall be given them by the President of the Board that more can be received.

Sec. 4. If any person shall entice or attempt to entice away from said School, any boy legally committed to the same, or shall knowingly harbor, conceal or aid in harboring or concealing any boy who shall have escaped from said School, such person shall, upon conviction thereof, be deemed guilty of a misdemeanor, and shall pay a fine of not less than ten or more than one hundred dollars, which shall be paid to the Treasurer of the Board of Trustees; and every sheriff, deputy sheriff, constable or officer of the local police, or any officer or employee of said School, shall have power, and it is hereby made his duty, to arrest any boy, when in his power to do so, who shall have escaped from said School, and return him thereto.

Sec. 5. That the Trustees shall have full power to place any boy committed as herein described, during minority, at such employment, and cause him to be instructed in such branches of useful knowledge as may be suitable to his years and capacity, as they may see fit; and they may, with the consent of any such boy, or his parents or guardians, bind him out as an apprentice during his minority, or for a shorter period, to learn a trade, or to other employment, as in their judgment will tend to his future benefit; and the President of the Board shall, for such a purpose, have power to execute and deliver, on behalf of the said Board, indentures of apprenticeship for any such boy, and such indentures shall have the same force and effect as indentures of apprenticeship executed by his legal guardian, and shall be filed with the records in the office of the Reform School.

Sec. 6. In case any boy so apprenticed shall prove untrustworthy and unreformed, the Trustees may, at their discretion, receive such boy into the Reform School, to be held in the same manner as before his said apprenticeship, and may thereupon cancel the indentures of such boy. And if, in the opinion of the Trustees, any boy apprenticed out by them shall have an unsuitable home, or if the person to whom such boy is indentured shall become unfit or incapable to properly raise or take care of him, the Trustees may, at their discretion, return such boy to the School.

Sec. 7. Whenever a boy is dismissed from the School to his parents, or to otherwise care for himself (except by indenture, as in the foregoing section), he shall be dismissed on probation merely, and the Board of Trustees shall have power to send for and return him to the School, when, in the opinion of a majority of the members of said Board, the interests of the boy will be promoted by such return.

Sec. 8. All acts inconsistent with the foregoing are hereby repealed.

An Act in Addition to an Act Entitled "An Act Concerning Education."

Resolved by this Assembly: That in the several Reform Schools in this State, equal privileges shall be granted to clergymen of all religious denominations to impart religious instructions to the inmates thereof, and that every opportunity be allowed such clergymen to give to the inmates belonging to their respective denominations such religious and moral instructions as said clergymen may desire, and the Trustees of said Institution shall prescribe reasonable times and places, not inconsistent with the proper management of said Institution, when and where such instruction may be given, and such instruction shall be open to all who may choose to attend.

Approved July 25, 1874.

BY-LAWS.

MEETINGS OF THE TRUSTEES.

Section 1. There shall be a regular meeting of the Board of Trustees held at the School in Meriden on the second Wednesday of January, April, July and October in each year, and the July meeting shall be the annual meeting.

Sec. 2. Special meetings shall be called by the President of the Board at the written request of two members, provided that ample notice and the object of such meetings shall be given.

Sec. 3. A majority of the members shall constitute a quorum for the transaction of business, but a smaller number present at any regular or special meeting may adjourn to any specified time.

Sec. 4. The Board of Trustees shall be organized annually at the regular meeting held in July by the election, by ballot, of a President, Secretary, Treasurer, an Executive Committee to consist of three members, and an Auditing Committee to consist of two members.

PRESIDENT.

Sec. 5. It shall be the duty of the President to preside at all the meetings of the Board, but in his absence, the Board shall appoint a chairman *pro tem.*

SECRETARY.

Sec. 6. It shall be the duty of the Secretary to keep an accurate record of all proceedings of the Board in a book provided for that purpose, which shall, at all times, be open to the inspection of any member; to prepare all documents and statements which may be ordered by the Board; to take charge of all communications, and reply thereto in accordance with such instructions as he may receive from the Board or Executive Committee.

TREASURER.

Sec. 7. The Treasurer shall receive and disburse the moneys of the Institution, and keep a true and just account of the same. He shall pay no bills except on an order drawn by the Superintendent, and countersigned by the Executive Committee, and for the faithful performance of his duties he shall give a satisfactory bond in the sum of eight thousand dollars.

EXECUTIVE COMMITTEE.

Sec. 8. It shall be the duty of the Executive Committee to make, or order the Superintendent to make, all purchases for the School, to authorize such repairs as may, from time to time, be necessary; but no expenditures for repairs exceeding one hundred dollars shall be authorized except by the Board. They shall examine as to whether economy is observed in the different departments of the School, and the quantity and quality of food and clothing furnished. They shall, once in each month, or oftener, if they choose, without notice to Superintendent or other officers, inspect the school buildings, and all the departments, rooms and closets thereof, and see that all are kept perfectly clean and neat; they shall inquire into the behavior of all officers and employees, and in a book, kept for that purpose, enter all their proceedings and observations, which book shall be laid before the Board at every meeting. They shall also, at each monthly meeting, examine all bills presented by the Superintendent, and, if found correct, approve the same.

Sec. 9. There shall be as many meetings of the Executive Committee as the interests of the School require.

AUDITING COMMITTEE.

Sec. 10. It shall be the duty of the Auditing Committee to examine the accounts of the Treasurer thoroughly and minutely, up to the 30th day of June in each year, and report thereon to the Board at the next regular meeting.

OFFICERS.

Sec. 11. The following named officers of the School shall be appointed by the Board of Trustees, whenever their services may be required, viz: a Superintendent, an Assistant Superintendent, Bookkeeper, Matron, Teachers, Overseers of the Workshops, and a Farmer.

Sec. 12. The several officers shall hold their appointments during the pleasure of the Board, and no resignation shall take effect until three months after being tendered in writing, except by consent of the Board of Trustees.

SUPERINTENDENT.

Sec. 13. The Superintendent shall have the general charge of the Institution.

He shall see that the subordinate officers are punctual and faithful in the discharge of their respective duties, and that the regulations and by-laws are carefully observed.

He shall keep a journal and make a record of all occurrences worthy of notice, which shall be subject to the inspection of any member of the Board.

He shall perform all the correspondence, keeping files of all letters received and copies of those sent, as far as important for reference. In suitable books he shall keep regular and complete accounts of all property entrusted to his care, showing the expenses and income of the Institution.

He shall make out and present to the Treasurer of the Institution the bill for weekly board of inmates, and perform all the duties of this department according to law.

Under the advice and direction of the Executive Committee, he shall procure the necessary supplies for the Institution, and purchase all such articles and materials as may be wanted for the support and employment of the boys, and dispose of all articles raised on the farm, or manufactured by them, which are not wanted for use.

In a suitable book, he shall keep an account of all purchases, and the cost for delivering the same at the Institution.

He shall daily inspect every part of the premises, and have a watchful care over the inmates, and be responsible for the proper care and discipline of the boys.

He, or the Assistant Superintendent, shall examine all packages and letters received for the boys, and shall examine their letters before being sent away.

He shall see that they receive no detriment to health for want of sufficient clothing by day or by night, from wet or cold, or from any other exposure, and that the rooms and buildings are properly warmed and ventilated.

He shall employ, whenever necessary, suitable persons for any temporary services not provided for in these by-laws, and report the same to the Executive Committee.

At each quarterly meeting he shall report to the Board the number of boys committed to the Reform School, also communicate full information of the state of the Institution, and make such suggestions as he may think proper for the consideration of the Board.

At each July meeting he shall furnish the Board with a duplicate copy of his accounts, presented to the State Comptroller of Public Accounts, up to the 30th day of June; also a full schedule of all property of the Institution, including everything in the care of the Farmer.

He shall at all times be ready to perform whatever other services may be required by the Board of Trustees, for the benefit of the Institution.

The Superintendent shall have the direction of the moral and religious instruction of the inmates. He shall perform devotional service, morning and evening; have charge of the Sabbath school, and obtain such aid from the reverend clergy in the vicinity as may be necessary.

He shall occasionally give familiar expositions of moral and religious duty in such a manner as he shall deem most conducive to the good of the boys, and at such times as may be determined on by consultation with the Trustees.

He shall mingle freely with the boys in kind, familiar intercourse, and spend as much time with them in conversation as he may think for their benefit, and as will be consistent with the proper performance of his duties and his position in the Institution.

At the quarterly meeting of the Trustees in July, he shall make a report, stating all facts respecting the reformatory influence effectively made use of in this Institution.

ASSISTANT SUPERINTENDENT.

Sec. 14. The Assistant Superintendent shall assume and perform all the duties of the Superintendent during his absence or inability.

THE MATRON.

Sec. 15. The Matron shall have the general charge and direction of all the domestic arrangements of the family, and shall see that cleanliness, order and propriety are uniformly maintained in her departments.

She shall see that all female assistants, except teachers, are diligent and faithful in the discharge of their respective duties, discreet and regular in their deportment, and strict in their observance of all the regulations of the Institution, and shall report to the Superintendent any remissness that may come to her knowledge.

She shall confer and advise with the Superintendent respecting the duties of the persons employed in the departments under her charge, and also as to the general management of the house.

TEACHERS.

Sec. 16. The teachers shall instruct the boys in such branches of education as may be required by the Superintendent, and shall use all proper means to inspire them with a love of study, and lead them justly to estimate the value of a sound and practical education, and shall constantly strive, by precept and example, to impress on their minds the importance of good order, self-government, and purity of body and mind.

They shall take charge of the boys at all times in the school-rooms, and shall require them to be promptly in their places at the appointed time, unless they are absent by permission of the Superintendent.

They shall attend to the cleanliness and good order of the school-rooms, and shall be responsible for the safety, care and preservation of all books, furniture, apparatus and fixtures provided for the same; and by strict personal examination, see that no injury or waste is suffered.

They shall assist in the Sabbath School, in the care of the boys on the Sabbath, in vocal music, and the principal teacher shall act as librarian to the boys.

OVERSEERS OF WORKSHOPS.

Sec. 17. The overseers of the workshops shall take charge of all tools used in their respective departments, and see that the same are carefully preserved and accounted for; shall see that all stock and material are worked with prudence and economy, and properly manufactured. They shall keep accurate accounts of the number of boys and time employed each day, of the work done, and of all articles made, and how disposed of. They shall attend to the cleaning, warming and ventilation, and keep a daily record of the temperature of their workshops.

They shall have charge of the boys during the work hours in the shops; shall exercise a prudent and judicious oversight; see that industry and good order are constantly observed, and return them to the yard, or such other place, and at such time as may be ordered by the Superintendent. They shall also assist the teachers, if requested, in their duties on the Sabbath, and in the Sabbath School.

WATCHMEN.

Sec. 18. The Superintendent will have power, with the approbation of the Executive Committee, to appoint one or more watchmen for night duty, whenever it is considered necessary for the safety of the Institution.

The watchman on duty shall, if required, perform a regular patrol throughout and around the building. He shall use the utmost vigilance to guard against damages by fire, to prevent escapes, and promptly notify the Superintendent on the first cause of alarm. He shall ring the bell in the morning, and at other times as may be directed, and perform any other service required by the Superintendent.

THE FARMER.

Sec. 19. The Farmer, under general or specific directions of the Superintendent, shall have charge of all the farming operations, and shall be responsible for the proper management, good order, and economical use of everything connected therewith, and shall use every means in his power to increase and preserve the products of the farm.

He shall take charge of, work with, and be responsible for such boys as the Superintendent may detail to be employed on the farm, and must patiently and perseveringly instruct them in the various kinds of farm work; require of them prompt obedience, and must, by example, together with constant and vigilant supervision, teach them to faithfully perform all duties required of them.

He shall see that all domestic animals are cared for in the best manner, well fed, properly cleaned and kindly treated.

He shall keep an accurate account of everything purchased for, the labor performed on, and the amount of each kind of produce raised on the farm.

He shall see that all rules and regulations of the Institution are strictly observed by all persons under his care, and shall promptly report to the Superintendent any one who may refuse or neglect to comply therewith.

THE LIBRARY.

Sec. 20. A library of well selected books and maps, and of Sunday School books, shall be kept at the School for the use and improvement of inmates thereof.

The Superintendent, Librarian and Chairman of the Executive Committee shall be a Standing Committee on the Library, who shall have in charge the efforts, ways and means to promote this department of the Institution, and they shall report to the Board of Trustees, at the quarterly meetings, the progress and condition of the Library, with a full list of all donations received for this object.

VISITORS.

Sec. 21. Visitors will always be welcome to visit the School between the hours of 9 A. M. and 4 P. M. on week days, and on Sundays for the purpose of attending the religious exercises, but on that day they must leave immediately after the services are ended.

Parents will not be permitted to visit their children oftener than once a month, unless by special permission of the Superintendent; and any article designed for any inmate must pass through the hands of the officer in attendance.

Visitors passing through the house or shops must not go among the boys, or address any conversation to them, except by permission of the attending officer.

Any visitor who shall attempt to give any inmate tobacco or other articles secretly, shall be altogether excluded from the premises.

Visitors shall not be permitted in or on the premises, except attended by an officer of the Institution.

GENERAL REGULATIONS.

Sec. 22. The distribution of time for each working day shall not be less than six hours for labor, four hours for school, and from four and one-half to five hours for devotional exercises, incidental duties and recreation.

The time of rising shall be half-past five o'clock A. M., from the first day of March to the first day of November, and at six o'clock during the other four months. The time of retiring shall be at eight o'clock P. M.

All persons having requisite duties to perform shall rise promptly at the ringing of the morning bell.

No person regularly employed at the Institution shall be absent from his or her duties without permission from the Superintendent or his Assistant, and persons getting such permission will be required to procure a substitute, to be approved by the Superintendent, to fulfill his or her duties during their absence.

It shall be incumbent on each officer to see that all rules and regulations are strictly observed, and they shall promptly report any failures therein. As the great object is *reform*, the intercourse of *all* with the boys should be so conducted as to convince them that this object is the chief end and aim of the School.

Every boy shall, at all times, be in charge of some responsible person, unless otherwise directed; any boy escaping by or through the neglect or carelessness of any officer, the whole or part of the expense incurred in his capture may be charged to such officer and deducted from his salary by order of the Trustees.

No person shall take or detain a boy from the performance of one duty to discharge another, without direction from the Superintendent; and no boy shall be kept or allowed to remain out of School without special permission from the Superintendent.

Any person having charge of the boys during their time of recreation, shall see that a kind and proper tone of feeling is observed among them, and that they do not use violence, or injure each other's clothing, or mar or deface the buildings, fixtures or furniture.

All persons employed at the Institution, who are in health, and can leave their appropriate duties at the time, shall attend the daily devotional exercises, and the religious services on the Sabbath, unless special leave of absence is granted.

No spirituous liquors or intoxicating drinks shall be brought to the Institution, unless by order of the physician. No officer or assistant shall at any time make use of such liquor, nor shall any one make use of tobacco, or smoke a pipe or cigar on or about the premises.

No tobacco shall be furnished or allowed to the delinquents in any form.

No officer shall be compelled to perform any duty inconsistent with those regularly assigned to him; but as this Institution is to be a family, as well as a School for detention and reformation, duties will occur growing out of this double relation which no by-laws can clearly indicate or provide for; therefore, *all* are expected to act agreeably to the *spirit* as well as the *letter* of these rules and regulations, and hold themselves ready at all times for any emergency to aid in preserving order, preventing escapes and maintaining the rules and discipline of the School, and by general and constant acts, accommodation, firmness and kindness accomplish the desired object.

DISCIPLINE.

The discipline shall be that of the family, the school, the workshop and the farm, and not that of the prison. The inmates are to be watched over as pupils, and not guarded as prisoners or criminals; and there shall be no more restraint than shall be necessary to develop good, and repress bad qualities. Self-instruction, self-desire to labor and self-government shall be inculcated and encouraged as the best culture as well as the most effective discipline.

Punishment shall be imposed as a public judgment, in manner and form to be prescribed by the Superintendent, and never under the excitement of the moment. Its severity shall always be proportionate to the magnitude of the offense. It shall consist of deprivation of food or play, marks of disapprobation or demerit, solitary confinement, and the use of the rod, as resorted to in well-regulated families. Personal chastisement shall only be inflicted for some high misdemeanor or repeated offense, and only on the order of the Superintendent; and in case of severe punishment, only in his presence or that of his Assistant.

These by-laws, or any part thereof, may be altered, amended, or repealed, at any regular meeting of the Board of Trustees.

Amended July 14, 1886.

ABSTRACT

OF

Returns of County Commissioners

IN RELATION TO

JAILS, AND THE RECEIPTS AND EXPENSES
OF THE SEVERAL COUNTIES,

IN THE STATE OF

CONNECTICUT,

FOR THE

YEAR ENDING JUNE 30, 1891.

COMPILED BY THE SECRETARY.

HARTFORD:
PRESS OF WILEY, WATERMAN & EATON.
1892.

State of Connecticut,

SECRETARY'S OFFICE,

HARTFORD, January 2, 1892.

The following abstracts of the returns of county commissioners in relation to jails, and the receipts and expenses of the several counties in the state, for the year ending June 30, 1891, are published in compliance with section 331, of the General Statutes.

R. JAY WALSH,
Secretary.

Abstract of Returns Concerning Jails.

Returns concerning JAILS for the County of HARTFORD, for the year ending June 30, 1891.

[Certified by E. G. Woodhouse, John A. Crilly and Edw. W. Dewey, County Commissioners.]

Number in jail, June 30, 1890,	209	
Committed during the year,	1,541	1,750
Discharged during the year,		1,556
Number remaining in jail, June 30, 1891,		194

COLOR AND SEX.

White,	Males, 1,335	Females, 163	Total white, 1,498
Colored,	Males, 39	Females, 4	Total colored, 43
	1,374	167	1,541

AGE.

Over 21 years,	Males, 1,274	Females, 167	Total adults, 1,441
Under 21 years,	Males, 100	Females, 0	Total minors, 100
	1,374	167	1,541

NATIVITY, ETC.

Natives of this state,	606
“ other states,	326
“ other countries,	609
“ this state, who cannot read or write,	32
“ other states, who cannot read or write,	24
“ other countries, who cannot read or write,	155
Who have been strictly temperate,	4
“ “ moderate drinkers,	1,417
“ “ habitually intemperate,	120
“ “ married,	450
“ “ in prison before,	895

COMMITTED.

For Adultery,	5
Assault,	146
Assault with intent to kill,	6
Attempt at rape,	3
Bastardy,	1
Breach of the peace,	166
Burglary,	22
Civil process,	2
Common drunkards,	37
Common prostitutes,	7
Contempt of court,	8
Cruelty to animals,	4
Defrauding,	10
For Drunkenness,	724
Embezzlement,	4
Forgery,	1
Fornication,	5
Frequenting house of ill-fame,	10
Horse stealing,	6
Injury to property,	2
Keeping house of ill-fame,	4
Larceny,	107
Lewd conduct,	4
Malicious injury,	4
Murder,	2

For Neglect of family, .	12
Obtaining goods on false pretense, . .	5
Resisting officer, .	17
Setting fires, . .	4
Stealing from the person,	18
Taking horse without leave,	7
For Tramps, . .	4
Trespass on R. R. .	37
Vagrancy, . .	122
Violation of liquor laws,	2
All other offenses, .	23
Total, . .	1,541

Average number in confinement during the year, . . 218¼

DISCHARGED.

By Writ of *habeas corpus*, .	2
Bail or recognizance, .	21
Payment of fine and costs,	532
Expiration of sentence,	807
State's attorney, .	14
County commissioners,	60
Order of court, . .	4
Sent to court and not returned,	82
Sent to state reform school,	2
Sent to state prison, .	24
Escaped and not retaken, .	2
Died, . . .	6
Total, . .	1,556

Returns concerning JAILS, for the County of NEW HAVEN, for the year ending June 30, 1891.

[Certified by Hiram Jacobs, Albert B. Dunham and Cecil A. Burleigh, County Commissioners.]

Number in jail, June 30, 1890, ...	199	
Committed during the year, ...	2,528	2,727
Discharged during the year, ...		2,517
Number remaining in jail, June 30, 1891, . .		210

COLOR AND SEX.

White,	Males,	2,142	Females,	307	Total white,	2,449
Colored,	Males,	57	Females,	22	Total colored,	79
		2,199		329		2,528

AGE.

Over 21 years,	Males,	2,079	Females,	316	Total adults,	2,395
Under 21 years,	Males,	120	Females,	13	Total minors,	133
		2,199		329		2,528

NATIVITY, ETC.

Natives of this state, ...	1,049
" other states, ...	516
" other countries, ...	963
" this state, who cannot read or write, . .	59
" other states, who cannot read or write, . .	74
" other countries, who cannot read or write, . .	240

Who have been strictly temperate,	*
“ “ moderate drinkers,	*
“ “ habitually intemperate,	*
“ “ married,	801
“ “ in prison before,	1,808

COMMITTED.

For Adultery,	8	For Injury to property,	15
Assault,	42	Keeping house of ill-fame,	23
Assault with intent to kill,	9	Larceny,	133
Attempt at rape,	2	Lewd conduct,	42
Bigamy,	2	Murder,	4
Breach of the peace,	407	Neglect of family,	17
Burglary,	11	Obtaining goods on false pretense,	7
Civil process,	16	Resisting officer,	64
Common drunkards,	18	Setting fires,	3
Contempt of court,	1	Stealing from the person,	10
Cruelty to animals,	10	Taking horse without leave,	11
Drunkenness,	1,460	Tramps,	6
Embezzlement,	11	Trespassing on R. R.,	12
Forgery,	3	Vagrancy,	108
Fornication,	9	All other offenses,	51
Frequenting house of ill-fame,	10		
Horse stealing,	3	Total,	2,528

Average number in confinement during the year, . . $211\frac{58}{100}$

DISCHARGED.

By Writ of *habeas corpus*,	2	Sent to insane asylum,	3
Bail or recognizance,	31	Sent to state prison,	19
Payment of fine and costs,	744	Process not specified above,	2
Expiration of sentence,	1,453	Died,	1
State's attorney,	101		
County commissioners,	61	Total,	2,517
Sent to court and not returned,	100		

Returns concerning JAILS for the County of NEW LONDON, for the year ending June 30, 1891.

[Certified by N. H. Ayer, J. F. Batty and G. A. Haskell, County Commissioners.]

Number in jail, June 30, 1890,	84	
Committed during the year,	985	1,069
Discharged during the year,		996
Number remaining in jail, June 30, 1891,		73

COLOR AND SEX.

White,	Males,	880	Females,	64	Total white,	944
Colored,	Males,	30	Females,	11	Total colored,	41
		910		75		985

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* No return.

AGE.

Over 21 years,	Males,	884	Females,	72	Total adults,	956
Under 21 years,	Males,	26	Females,	3	Total minors,	29
		910		75		985

NATIVITY, ETC.

Natives of this state,	331
" other states,	292
" other countries,	362
" this state, who cannot read or write,	21
" other states, who cannot read or write,	24
" other countries, who cannot read or write,	39
Who have been strictly temperate,	42
" " moderate drinkers,	504
" " habitually intemperate,	439
" " married,	312
" " in prison before,	538

COMMITTED.

For Adultery,	5
Assault,	8
Assault with intent to kill,	3
Attempt at rape,	2
Bastardy,	1
Breach of the peace,	110
Burglary,	22
Common drunkards,	3
Common prostitutes,	1
Contempt of court,	1
Defrauding,	5
Drunkenness,	642
Forgery,	3
Frequenting house of ill-fame,	10
Horse stealing,	4
For Injury to property,	2
Keeping house of ill-fame,	2
Larceny,	25
Neglect of family,	3
Obtaining goods on false pretense,	2
Rape,	4
Resisting officer,	4
Stealing from the person,	4
Tramps,	5
Trespassing on R. R,.	28
Vagrancy,	65
Violation of liquor law,	7
All other offenses,	14
Total,	985

Average number in confinement during the year, . . $91\frac{42}{100}$

DISCHARGED.

By Bail or recognizance,	12
Payment of fine and costs,	325
Expiration of sentence,	592
State's attorney,	4
County commissioners,	18
Transferred to other jails for trial,	9
Sent to court and not returned,	21
Sent to state prison,	8
By process not specified above,	7
Total,	996

Returns concerning JAILS for the County of FAIRFIELD, for the year ending June 30, 1891.

[Certified by John O. Page, Joseph W. Johnson and Whitman S. Mead, County Commissioners.]

Number in jail, June 30, 1890,	122	
Committed during the year,	1,755	1,877
Discharged during the year,		1,692
Number remaining in jail, June 30, 1891,		185

COLOR AND SEX.

White,	Males, 1,430	Females, 142	Total white, 1,572
Colored,	Males, 167	Females, 16	Total colored, 183
	1,597	158	1,755

AGE.

Over 21 years,	Males, 1,455	Females, 153	Total adults, 1,608
Under 21 years,	Males, 142	Females, 5	Total minors, 147
	1,597	158	1,755

NATIVITY, ETC.

Natives of this state,	558
" other states,	451
" other countries,	746
" this state, who cannot read or write,	23
" other states, who cannot read or write,	16
" other countries who cannot read or write,	100
Who have been strictly temperate,	75
" " moderate drinkers,	286
" " habitually intemperate,	1,394
" " married,	373
" " in prison before,	1,066

COMMITTED.

For Adultery,	8	For Forgery,	9
Assault,	110	Fornication,	4
Assault with intent to kill,	23	Frequenting house of ill-fame,	10
Attempt at rape,	6	Horse stealing,	8
Bastardy,	1	Injury to property,	18
Breach of the peace,	227	Keeping house of ill-fame,	11
Burglary,	65	Larceny,	133
Civil process,	6	Lewd conduct,	12
Common drunkards,	34	Manslaughter,	7
Common prostitutes,	13	Murder,	1
Contempt of court,	2	Neglect of family,	11
Cruelty to animals,	6	Obtaining goods on false pretense,	2
Defrauding,	18	Rape,	2
Drunkenness,	556		
Embezzlement,	2		

For Resisting officer,	24	For Vagrancy,	251
Robbery,	32	Violation of liquor law,	2
Setting fires,	5	All other offenses,	41
Stealing from the person,	49		
Taking horse without leave,	4	Total,	1,755
Tramps,	29		
Trespassing on R. R.,	13		

Average number in confinement during the year, . . 122¼

DISCHARGED.

By Writ of *habeas corpus*,	2	Sent to state reform school,	4
Bail or recognizance,	16	Sent to state prison,	38
Payment of fine and costs,	276	Executed,	1
Expiration of sentence,	1,177	By process not specified above,	44
State's attorney,	44	Died,	1
County commissioners,	50		
Transferred to other jails for trial,	10	Total,	1,692
Sent to court and not returned,	29		

Returns concerning JAILS for the County of WINDHAM, for the year ending June 30, 1891.

[Certified by John Kelly, George Morse and E. H. Hall, County Commissioners.]

Number in jail, June 30, 1890,	27	
Committed during the year,	190	217
Discharged during the year,		199
Number remaining in jail, June 30, 1891,		18

COLOR AND SEX.

White,	Males,	185	Females,	1	Total white,	186
Colored,	Males,	4	Females,	0	Total colored,	4
		189		1		190

AGE.

Over 21 years,	Males,	161	Females,	1	Total adults,	162
Under 21 years,	Males,	28	Females,	0	Total minors,	28
		189		1		190

NATIVITY, ETC.

Natives of this state,	44
" other states,	63
" other countries,	83
" this state, who cannot read or write,	1
" other states, who cannot read or write,	1
" other countries, who cannot read or write,	16

Who have been strictly temperate,	0
" " moderate drinkers,	189
" " habitually intemperate,	1
" " married,	43
" " in prison before,	90

COMMITTED.

For Assault,	18	For Larceny,	19
Assault with intent to kill,	1	Neglect of family,	6
Breach of the peace,	4	Setting fires,	2
Burglary,	2	Tramps,	9
Common drunkard,	1	Vagrancy,	13
Defrauding,	7	Violation of liquor law,	2
Drunkenness,	99	All other offenses,	2
Forgery,	1		
Horse stealing,	2	Total,	190
Injury to property,	2		

Average number in confinement during the year,	28½

DISCHARGED.

By Payment of fine and costs,	30	Sent to state prison,	9
Expiration of sentence,	131	Escaped and not retaken,	3
State's attorney,	3	By process not specified above,	1
County commissioners,	6		
Sent to court and not returned,	14	Total,	199
Sent to insane retreat,	2		

Returns concerning JAILS for the County of LITCHFIELD, for the year ending June 30, 1891.

[Certified by S. N. Pettibone, J. K. Judson and H. O. Warner, County Commissioners.]

Number in jail, June 30, 1890,	23	
Committed during the year,	130	153
Discharged during the year,		130
Number remaining in jail, June 30, 1891,		23

COLOR AND SEX.

White,	Males,	117	Females,	6	Total white,	123
Colored,	Males,	5	Females,	2	Total colored,	7
		122		8		130

AGE.

Over 21 years,	Males,	114	Females,	6	Total adults,	120
Under 21 years,	Males,	8	Females,	2	Total minors,	10
		122		8		130

NATIVITY, ETC.

Natives of this state,			56
“	other states,		37
“	other countries,		37
“	this state, who cannot read or write,		6
“	other states, who cannot read or write,		2
“	other countries, who cannot read or write,		11
Who have been strictly temperate,			14
“	“	moderate drinkers,	86
“	“	habitually intemperate,	30
“	“	married,	48
“	“	in prison before,	61

COMMITTED.

For Adultery,	2	For Horse stealing,	3
Assault,	9	Keeping house of ill-fame,	2
Attempt at rape,	1	Larceny,	10
Bigamy,	1	Murder,	4
Breach of the peace,	12	Resisting officer,	3
Burglary,	4	Stealing from the person,	1
Contempt of court,	1	Taking horse without leave,	1
Cruelty to animals,	1	Tramps,	2
Defrauding,	7	Vagrancy,	3
Drunkenness,	48	All other offenses,	11
Forgery,	1		
Fornication,	2	Total,	130
Frequenting house of ill-fame,	1		

Average number in confinement during the year, . . . $27\frac{11}{53}$

DISCHARGED.

By writ of *habeas corpus*,	2	By County commissioners,	1
Bail or recognizance,	9	Sent to state prison,	6
Payment of fine and costs,	49	By process not specified above,	2
Expiration of sentence,	48		
State's attorney,	13	Total,	130

Returns concerning JAILS for the County of MIDDLESEX, for the year ending June 30, 1891.

[Certified by Charles L. Griswold, R. C. Shepard and H. D. Chapman, County Commissioners.]

Number in jail, June 30, 1890,	21	
Committed during the year,	170	191
Discharged during the year,		156
Number remaining in jail, June 30, 1891,		35

COLOR AND SEX.

White,	Males,	158	Females,	12	Total white,	170
Colored,	Males,	0	Females,	0	Total colored,	0
		158		12		170

AGE.

Over 21 years,	Males,	145	Females,	12	Total adults,	157
Under 21 years,	Males,	13	Females,	0	Total minors,	13
		158		12		170

NATIVITY, ETC.

Natives of this state,	73
" other states,	14
" other countries,	83
" this state, who cannot read or write,	6
" other states, who cannot read or write,	2
" other countries, who cannot read or write,	26
Who have been strictly temperate,	5
" " moderate drinkers,	73
" " habitually intemperate,	92
" " married,	60
" " in prison before,	143

COMMITTED.

For Assault,	19	For Neglect of family,	1
Assault with intent to kill,	1	Resisting officer,	2
Attempt at rape,	3	Robbery,	14
Breach of the peace,	8	Stealing from the person,	1
Burglary,	8	Taking horse without leave,	2
Common drunkards,	1	Vagrancy,	2
Cruelty to animals,	1	All other offenses,	12
Drunkenness,	88		
Fornication,	3	Total,	170
Horse stealing,	3		

Average number in confinement during the year, . . $22\frac{44}{100}$

DISCHARGED.

By Bail or recognizance,	2	Sent to court and not returned,	2
Payment of fine and costs,	21	Sent to state prison,	3
Expiration of sentence,	124		
State's attorney,	4	Total,	156

Returns concerning JAILS for the County of TOLLAND, for the year ending June 30, 1891.

[Certified by M. P. J. Walker, Adolph Korper and C. E. Brown, County Commissioners.]

Number in jail, June 30, 1890,	4	
Committed during the year,	102	106
Discharged during the year,		98
Number remaining in jail, June 30, 1891,		8

COLOR AND SEX.

White,	Males,	97	Females,	3	Total white,	100
Colored,	Males,	2	Females,	0	Total colored,	2
		99		3		102

AGE.

Over 21 years,	Males,	95	Females,	2	Total adults,	97
Under 21 years,	Males,	4	Females,	1	Total minors,	5
		99		3		102

NATIVITY, ETC.

Natives of this state,	70
" other states,	0
" other countries,	32
" this state, who cannot read or write,	*
" other states, who cannot read or write,	*
" other countries, who cannot read or write,	*
Who have been strictly temperate,	0
" " moderate drinkers,	50
" " habitually intemperate,	52
" " married,	47
" " in prison before,	21

COMMITTED.

For Assault,	8	For Neglect of family,	3
Breach of the peace,	9	Rape,	1
Burglary,	1	Resisting officer,	2
Civil process,	1	Setting fires,	2
Contempt of court,	1	Trespassing on R. R.,	2
Defrauding,	2	Vagrancy,	1
Drunkenness,	52	Violation of liquor law,	2
Horse stealing,	2	All other offenses,	5
Larceny,	7		
Lewd conduct,	1	Total,	102

Average number in confinement during the year, . . $13\frac{3}{20}$

DISCHARGED.

By Bail or recognizance,	1	Sent to state prison,	2
Payment of fine and costs,	14	Process not specified above,	2
Expiration of sentence,	71		
State's attorney,	8	Total,	98

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* Not returned.

COLOR, AGE, SEX, NATIVITY, HABITS.

		Hartford.	New Haven.	New London.	Fairfield.	Windham.	Litchfield,	Middlesex.	Tolland.	Total.
MALES.	White,	1,335	2,142	880	1,430	185	117	158	97	6,344
	Colored,	39	57	30	167	4	5	0	2	304
	Adults,	1,274	2,079	884	1,455	161	114	145	95	6,207
	Minors,	100	120	26	142	28	8	13	4	441
	Total Males,	1,374	2,199	910	1,597	189	122	158	99	6,648
FEMALES.	White,	163	307	64	142	1	6	12	3	698
	Colored,	4	22	11	16	0	2	0	0	55
	Adults,	167	316	72	153	1	6	12	2	729
	Minors,	0	13	3	5	0	2	0	1	24
	Total Females,	167	329	75	158	1	8	12	3	753
Total,		1,541	2,528	985	1,755	190	130	170	102	7,401
Natives of this state,		606	1,049	331	558	44	56	73	70	2,787
Natives of other states,		326	516	292	451	63	37	14	0	1,699
Natives of other countries,		609	963	362	746	83	37	83	32	2,915
Total,		1,541	2,528	985	1,755	190	130	170	102	7,401
Strictly temperate,		4	*	42	75	0	14	5	0	
Moderate drinkers,		1,417	*	504	286	189	86	73	50	
Habitually intemperate,		120	*	439	1 394	1	30	92	52	

* No return.

OFFENSES.

FOR WHAT OFFENSES COMMITTED.	Hartford.	New Haven.	New London.	Fairfield.	Windham.	Litchfield.	Middlesex.	Tolland.	Total.
Abortion,	......	......	....	......	....	....	....	...	.....
Adultery,	5	8	5	8	.	2	....	...	28
Assault,	146	42	8	110	18	9	19	8	360
Assault with intent to kill,	6	9	3	23	1	. ..	1	...	43
Attempt at rape,	3	2	2	6	....	1	3	...	17
Bastardy,	1	......	1	1	....	....	....	...	3
Bigamy,	......	2	....	......	....	1	....	...	3
Breach of the peace,	166	407	110	227	4	12	8	9	943
Burglary,	22	11	22	65	2	4	8	1	135
Civil process,	2	16	....	6	....	....	....	1	25
Common drunkard,	37	18	3	34	1	....	1	...	94
Common prostitute,	7	......	1	13	....	....	....	...	21
Contempt of court,	8	1	1	2	....	1	....	1	14
Cruelty to animals,	4	10	....	6	....	1	1	...	22
Defrauding,	10	......	5	18	7	7	....	2	49
Drunkenness,	724	1,460	642	556	99	48	88	52	3,669
Embezzlement,	4	11	....	2	....	....	....	...	17
Forgery,	1	3	3	9	1	1	....	...	18
Fornication,	5	9	....	4	....	2	3	...	23
Frequenting house of ill-fame,	10	10	10	10	....	1	....	...	41
Horse stealing,	6	3	4	8	2	3	3	2	31
Injury to property,	2	15	2	18	2	....	....	...	39
Keeping house of ill-fame,	4	23	2	11	....	2	....	...	42
Larceny,	107	133	25	133	19	10	....	7	434
Lewd conduct,	4	42	....	12	....	....	....	1	59
Making or passing counterfeit money,	......	......	....	......	....	....	....	...	.....
Malicious injury,	4	......	....	......	....	....	....	...	4
Manslaughter,	......	......	....	7	....	....	....	...	7
Murder,	2	4	....	1	...	4	....	...	11
Neglect of family,	12	17	3	11	6	....	1	3	53
Obtaining goods on false pretense,	5	7	2	2	....	....	....	...	16
Perjury,	......	......	....	......	....	....	....	...	.....
Rape,	......	......	4	2	....	....	....	1	7
Resisting officer,	17	64	4	24	....	3	2	2	116
Robbery,	......	......	....	32	....	....	14	...	46
Seduction,	......	......	....	......	....	....	....	...	.....
Setting fires,	4	3	....	5	2	....	....	2	16
Stealing from the person,	18	10	4	49	....	1	1	...	83
Taking horse without leave,	7	11	....	4	....	1	2	..	25
Tramps,	4	6	5	29	9	2	....	...	55
Trespass on railroad property,	37	12	28	13	....	....	...	2	92
Vagrancy,	122	108	65	251	13	3	2	1	565
Violation of liquor law,	2	......	7	2	2	....	....	2	15
All other offenses,	23	51	14	41	2	11	13	5	160
Total,	1,541	2,528	985	1,755	190	130	170	102	7,401

Receipts and Expenses of the Several Counties

FOR THE YEAR ENDING JUNE 30, 1891.

Receipts of the County of HARTFORD, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$18,525.24
from the United States,	346.56
from the City of Hartford,	169.00
from earnings of prisoners,	1,700.00
“ sales at jail,	433.18
“ sheriff,	42.12
“ licenses, 5 per cent.,	6,707.45
“ licenses transferred,	120.00
“ license bonds forfeited,	50.00
“ license, miscellaneous receipts,	91.00
“ temporary loan,	2,000.00
“ interest,	562.11
“ towns, for county home,	176.84
“ sales at court house,	50.00
Total,	$30,973.50

AMOUNT DUE THE COUNTY.

From state, for board of prisoners,	$6,196.74
For temporary home,	5,167.78
Total,	$11,364.52

Expenditures of the County of HARTFORD, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$8,658.52
“ clothing,	751.87
“ bedding,	148.81
“ fuel,	1,468.55
“ lights,	120.58
“ medicines,	176.34
“ medical attendance,	150.00
“ salary of jailer,	1,000.00
“ salary of assistants,	3,813.33
“ salary of chaplain,	100.00
“ building and repairs,	395.77
“ water and ice,	431.71
“ telephone,	32.55
“ transportation,	5.50
“ stationery and stamps,	18.25

Paid at jail for supplies,	$812.44
at court house for repairs,	523.57
“ furniture,	321.26
“ janitor and assistant,	1,620.00
“ incidental expenses,	223.87
“ bar library,	300.00
at county home,	3,551.84
Salary of county commissioners, (13 months),	3,598.90
“ county treasurer,	300.00
“ county auditors,	40.00
Incidental office expenses,	89.34
Miscellaneous license expenses,	442.57
License blanks,	87.00
Insurance (boiler at jail),	102.50
“ (boiler at court house),	100.00
Publication of jail report,	55.50
County loan,	6,000.00
Interest	817.60
Total,	$36,258.27

INDEBTEDNESS OF THE COUNTY.

Accepted orders on treasury, bearing 4 per cent. interest,	17,000.00

Receipts of the County of NEW HAVEN, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners:	from the state,	$27,382.95
	from the United States,	147.88
	on civil process,	22.96
	on appeal,	.64
from earnings of prisoners,		2,825.00
“ sales at jail,		434.92
“ licenses, 5 per cent.,		16,076.55
“ license transfers,		240.00
“ rent of law chambers,		3,101.67
“ interest on notes and bonds,		520.00
“ telegraph and telephone companies, for use of bridges,		74.38
Total,		$50,826.95

Key fees, $1,393.00.

AMOUNT DUE TO THE COUNTY.

On account of temporary home,	$4,179.03

Expenditures of the County of NEW HAVEN, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$14,510.28
“ clothing and shoes,	919.00

Paid at jail for bedding,	$416.79
“ fuel,	1,667.55
“ lights,	344.70
“ medicines and medical attendance,	721.38
“ salary of jailer,	1,000.00
“ salary of assistants,	2,975.70
“ salary of chaplain,	125.00
“ building and repairs, (new chapel),	11,289.05
“ water and ice,	619.18
“ telephone,	63.75
“ transportation,	50.10
“ stationery and stamps,	108.33
at court house for repairs,	1,285.87
“ furniture,	471.43
“ water, coal and gas,	425.69
“ janitor,	1,300.00
“ engineer,	910.00
“ incidentals,	243.77
at county home, for expenses,	6,010.00
“ building and repairs,	2,556.85
Salary of county commissioners,	3,793.91
“ county treasurer,	400.00
“ county auditors,	140.00
Insurance,	779.99
Stationery, blanks and stamps,	186.55
Incidental office expenses,	33.33
Waterbury bar library,	530.00
Board of prisoners by Fairfield county,	58.89
Repairs, etc., of bridges,	1,650.00
Safe for sheriff's office,	75.00
Revocation costs,	149.68
Court record,	88.25
Electric time,	23.63
Total,	$55,923.65

Receipts of the County of NEW LONDON, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$3,362.46
from the United States,	110.14
from earnings of prisoners,	639.86
“ licenses, 5 per cent.,	2,844.60
“ license transfers,	2.00
“ towns, for county home,	456.88
“ sales at county home,	8.00
“ loan,	3,000.00
Total,	$10,423.94

AMOUNT DUE THE COUNTY.

From the state, for board of children at county home,	$3,111.37
for board of prisoners,	7,224.64
Total,	$10,336.01

Expenditures of the County of NEW LONDON, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$3,498.54
“ clothing,	238.04
“ fuel,	587.02
“ light,	49.22
“ medicines,	249.84
“ medical attendance,	30.50
“ salary of jailer,	1,200.00
“ salary of assistants,	1,039.50
“ salary of chaplain,	35.00
“ building and repairs,	1,224.20
“ furniture,	9.30
“ water and ice,	138.75
“ telephone,	71.00
“ stationery and stamps,	48.00
“ inspecting boilers,	10.00
“ barn expenses,	615.41
“ blacksmith,	31.26
“ material for labor,	166.57
“ cow,	45.00
“ pigs,	28.00
“ all other expenses,	211.98
at court house for repairs,	113.63
“ telephone,	40.00
“ water and ice,	20.00
“ janitor,	300.46
at county home, expenses	2,981.12
Salary of county commissioners,	1,550.78
“ county treasurer,	180.00
“ county auditors,	40.00
Insurance,	109.00
Stationery, blanks, and stamps,	93.02
Incidental office expenses,	11.00
Attorney,	28.87
Total,	$14,995.01

INDEBTEDNESS OF THE COUNTY.

Notes at 5 per cent.,	$3,000.00
To city of Norwich, court house expenses,	886.69
Total,	$3,886.69

Receipts of the County of FAIRFIELD, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$13,781.96
from the United States,	21.44
from earnings of prisoners,	1,000.00
“ key fees,	646.00
“ sale of stone,	36.30
“ “ old boiler,	40.00

Received from sale of old furniture,	$7.00
" licenses, 5 per cent.,	9,129.90
" license bonds forfeited,	1,810.92
" county tax,	245.25
" bonds issued,	20,888.89
" notes,	20,000.00
" telegraph and telephone companies for use of bridges,	74.37
" New Haven County, for board of prisoners,	58.89
" interest,	416.51
" boiler insurance,	190.26
Total,	$68,347.69

AMOUNT DUE TO THE COUNTY.

From state, for board of prisoners,	$3,100.62
Key fees,	158.00
Total,	$3,258.62

Expenditures of the County of FAIRFIELD, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$7,486.06
" clothing,	974.10
" bedding,	559.56
" fuel,	1,382.76
" light,	562.81
" medicines,	235.74
" medical attendance,	223.00
" salary of jailers,	2,316.67
" salary of assistants,	3,104.54
" building and repairs,	2,793.13
" furniture,	324.66
" water and ice,	793.41
" telephone,	105.45
" transportation,	26.56
" stationery and stamps,	140.80
" horse feed,	218.52
" inspection,	399.60
" key fees,	845.50
" insurance,	25.00
" fireman,	409.50
" auditors,	40.00
" supplies,	528.03
" miscellaneous,	435.52
at court house for repairs,	619.53
" telephone,	63.75
" furniture,	1,618.39
" supplies,	192.72
" janitor and engineer,	1,326.31
" law library,	300.00
" elevator,	210.63
" common pleas court, expenses,	88.55
at county home: building and repairs (new building),	5,541.28
expenses,	4,275.00

Paid Salary of county commissioners,	$3,779.87
“ county treasurer,	185.00
“ county auditors,	100.00
Insurance,	90.00
Stationery, blanks, and stamps,	142.86
Incidental office expenses,	253.58
New jail account,	43,185.40
Maintenance of joint bridges,	1,745.00
Interest on bonds,	2,000.00
Interest on treasurer's balances,	69.94
Collection of forfeited bonds,	490.73
Commissioner's court,	340.94
Legal advice,	271.40
Report of convictions,	77.00
Total,	$90,898.80

INDEBTEDNESS OF THE COUNTY.

Bonds at 4 per cent.,	$60.000.00
Notes “ “	20,000.00
Total,	$80,000.00

Receipts of the County of WINDHAM, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$3,138.04
from earnings of prisoners,	1,698.33
“ board of transient persons,	7.00
“ sales at jail,	339.68
“ sales of produce	146.54
“ sales of sundries,	7.52
“ rent of land,	44.50
“ licenses, 5 per cent.,	531.25
“ license transfers,	6.00
“ loan,	3,500.00
“ towns, for county home,	571.55
“ sales at county home: butter,	234.55
“ “ “ live stock,	256.31
“ “ “ pork,	68.92
“ “ “ sundries,	13.40
Total,	$10,563.59
“ key fees,	107.50

AMOUNT DUE TO THE COUNTY.

From state, for board of prisoners,	$411.79
“ state, for support of children,	2,436.30
“ towns, for support of children,	35.00
Total,	$2,883.09

Expenditures of the County of WINDHAM, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$2,195.56
“ clothing,	177.15
“ furnishing,	426.73
“ fuel,	106.72
“ light,	16.30
“ medicines and medical attendance,	17.42
“ salary of jailer,	800.00
“ salary of assistants,	495.27
“ salary of chaplain,	20.00
“ building and repairs,	135.02
“ telephone,	40.00
“ live stock,	50.00
“ grain,	192.70
“ hardware,	93.73
“ blacksmithing,	69.09
“ housework,	156.00
“ fertilizers,	77.60
“ rent of land,	85.00
“ all other expenses,	77.26
at court house for binding records,	174.40
“ rent of clerk's office,	76.00
at county home, expenses,	3,772.51
printing,	48.00
interest,	297.20
Salary of county commissioners,	766.41
“ county treasurer,	40.00
“ county auditors,	10.00
Insurance,	49.50
Order book,	5.25
Incidental office expenses,	15.00
Total,	$10,485.82

INDEBTEDNESS OF THE COUNTY.

Outstanding orders at 4½ per cent.,	$13,000.00

Receipts of the County of LITCHFIELD, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$3,628.29
from earnings of prisoners,	1,140.29
“ licenses, 5 per cent.,	855.40
“ county tax,	6,106.97
“ towns, for county home,	608.38
“ state, county home,	289.09
Total,	$12,628.42

AMOUNT DUE TO THE COUNTY.

From state, for board of prisoners,	$104.14
" labor of prisoners,	688.17
" towns, for temporary home,	316.08
" state, for temporary home,	637.67
" towns, county tax,	569.32
Total,	$2,315.38

Expenditures of the County of LITCHFIELD, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$1,664.69
" clothing,	136.24
" bedding,	8.54
" fuel,	356.91
" light,	38.29
" medicines,	105.39
" medical attendance,	36.75
" salary of jailer,	540.00
" salary of assistants,	336.00
" building and repairs,	551.35
" water and ice,	41.67
" transportation,	17.56
" contractor prisoners' labor,	50.00
at court house for repairs,	144.18
" telephone,	25.00
" janitor,	5.00
at county home: expenses,	2,563.03
Salary of county commissioners,	847.13
" county auditors,	25.00
Insurance,	112.50
Stationery, blanks, and stamps,	66.36
License revocation,	27.01
County tax,	5.00
Wagon and harness,	62.00
Rents,	175.00
Advertising,	17.50
Supplies,	515.90
Total,	$8,474.00

Receipts of the County of MIDDLESEX, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$2,625.25
from sales at jail,	186.80
" licenses, 5 per cent.,	1,032.60
" county tax,	7,214.87
" towns, for county home,	923.18
" rent,	22.73
Total,	$12,005.43

AMOUNT DUE TO THE COUNTY.

From state, for board of prisoners,	$732.90
“ towns, for board of children,	133.50
“ state, for board of children,	1,774.41
Total,	2,640.81

Expenditures of the County of MIDDLESEX, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$1,816.29
“ clothing,	282.57
“ bedding,	6.00
“ fuel,	361.15
“ lights,	56.10
“ medical attendance,	36.89
“ salary of jailers,	970.00
“ salary of assistants,	477.15
“ building and repairs of jails,	410.81
“ transfer of prisoners,	581.05
“ board of prisoners, at Middletown,	274.22
“ farm and household implements,	75.55
“ stationery and stamps,	73.47
“ rent of offices,	557.50
at court house for repairs,	34.95
at county home, expenses,	3,566.37
Salary of county commissioners,	1,397.44
“ county treasurer,	100.00
“ county auditors,	40.00
Freight and transportation,	132.44
Farm expenses,	580.36
Miscellaneous,	716.43
Total,	$12,546.74

Receipts of the County of TOLLAND, for the year ending June 30, 1891, *with a statement of the amounts due to the County on that date.*

Received for board of prisoners: from the state,	$1,541.46
from earnings of prisoners,	37.25
“ sale of pork and butter,	32.77
“ sale of sundries,	21.96
“ licenses, 5 per cent.,	316.75
“ county tax,	4,242.41
“ towns, for county home,	690.40
“ state, for county home,	450.18
“ water rent,	25.00
“ expenses in part of water works,	207.82
“ loans, notes at 5 per cent,	4,200.00
Total,	$11,766.00

AMOUNT DUE TO COUNTY.

From state, for board of prisoners,	$112.77
" board of children at county home,	1,654.74
From towns, for board of children at county home,	98.00
Sundries,	11.16
Total,	$1,876.67

Expenditures of the County of TOLLAND, for the year ending June 30, 1891, *with a statement of the indebtedness on that date.*

Paid at jail for provisions,	$1,541.38
" clothing,	194.74
" fuel,	100.50
" medicines,	33.65
" medical attendants,	59.55
" salary of jailer,	425.00
" building and repairs,	43.68
" water and ice,	50.00
" sundries,	17.62
at court house, for repairs,	103.44
" repairs of county house,	152.29
at county home, building and repairs,	887.99
" " expenses,	3,059.31
" " new water works,	962.54
Salary of county commisssioners, (15 months),	1,261.02
County treasurer, (2 years),	100.00
County auditors,	20.00
for stationery and stamps,	15.25
" license book,	10.00
" legal advice,	11.00
" express,	1.20
loan,	1,546.77
interest,	53.75
telephone,	8.10
incidental office expenses,	10.00
costs in Ryan's case,	12.98
Total,	$10,681.76

INDEBTEDNESS OF THE COUNTY.

Notes at 5 per cent. interest,	$2,700.00

REPORTS OF COUNTY COMMISSIONERS,

FOR THE YEAR ENDING JUNE 30, 1891,

IN RELATION TO LICENSES.

TOWNS. HARTFORD CO.	LIQUOR LICENSES.		BEER LICENSES.		DRUGGISTS' LICENSES.		Total Number of Licenses.	Total Amounts Received.	Amount Paid County Treasurer.	Amount Paid Treasurer of Town.
	No.	Amounts Received.	No.	Amounts Received.	No.	Amounts Received.				
Hartford,	204	$74,940.00	19	$2,634.00	29	$1,374.00	252	$78,948.00	$3,947.40	$75,000.60
Avon,	4	400.00	..	...	..	....	4	400 00	20.00	380.00
Berlin,	4	375.00	..	....	..	....	4	375.00	18.75	356.25
Bristol,	13	3,900.00	..	....	6	300.00	19	4,200.00	210.00	3,990.00
Burlington,	7	675.00	..	....	..	....	7	675 00	33.75	641.25
Canton,	..	....	..	...	2	20.00	2	20.00	1.00	19.00
East Granby,	2	200,00	..	....	..	....	2	200.00	10.00	190.00
East Hartford,	3	900.00	..	....	5	210.00	8	1,110.00	55.50	1,054.50
East Windsor,	9	900.00	1	20.00	..	....	10	920.00	46.00	874.00
Enfield,	18	5,400.00	2	300.00	4	162.00	24	5,862.00	293.10	5,568.90
Farmington,	7	2,100.00	..	....	1	10.00	8	2,110.00	105.50	2,004.50
Glastonbury,	..	....	..	....	..	...	1	10.00	.50	9.50
Granby,	3	292.00	..	....	..	...	3	292.00	14.50	277.40
Manchester,	9	2,200.00	..	...	6	300.00	15	2,500.00	125.00	2,375.00
New Britain,	71	25,386.00	13	2,284.00	9	450.00	93	28,120.00	1,406.00	26,714.00
Plainville,	10	967.00	..	....	2	100.00	12	1,067.00	53.35	1,013.65
Rocky Hill,	2	200.00	..	...	..	....	2	200.00	10.00	190.00
Southington,	15	4,500.00	5	600.00	3	150.00	23	5,250.00	262.50	4,987.50
Suffield,	3	700.00	..	....	..	....	3	700.00	35.00	665.00
Wethersfield,	..	....	..	....	2	20.00	2	20.00	1.00	19.00
Windsor,	6	600.00	..	....	1	50.00	7	650.00	32.50	617.50
Windsor Locks,	5	500.00	..	....	2	20.00	7	520.00	26.00	494.00
Total,	395	$125,135.00	40	$5,838.00	73	$3,176.00	508	$134,149.00	$6,707.45	$127,441.55

NEW HAVEN CO.										
New Haven,	381	$144,305.00	26	$4,715.00	54	$2,324.00	461	$151,344.00	$7,567.20	$136,587.98*
Ansonia,	54	20,385.00	..	....	6	300.00	60	20,685.00	1,034 25	19,650.75
Beacon Falls,	3	300.00	..	....	..	....	3	300.00	15.00	285.00
Bethany,	2	150.00	..	....	..	....	2	150.00	7.50	142.50
Branford,	17	5,805.00	..	....	3	110.00	20	5,915.00	295.75	5,619.25
Cheshire,	2	200.00	..	....	1	50.00	3	250.00	12.50	237.50
Derby	30	11,140.00	3	600.00	6	263.00	39	12,003.00	605.15	11,402.85
Guilford,	2	195.00	.	....	1	10.00	3	205.00	10 25	194.75
Hamden,	6	2,200.00	1	200.00	1	50.00	8	2,450.00	122.50	2,327.50
Meriden,	94	35,715.00	10	1,535.00	13	592.00	117	37,842.00	1,892.10	35,949.90
Milford,	7	2,570.00	..	....	1	50.00	8	2.620.00	131.00	2,489.00
Naugatuck,	31	11 250.00	2	400 00	3	142.00	36	11,792.00	589.60	11,202.40
Orange,	21	4,840.00	2	285.00	2	100.00	25	5,225.00	261.25	4,963.75
Oxford,	1	100.00	..	....	..	....	1	100 00	5.00	95.00
Seymour,	12	4,500.00	..	....	2	100.00	14	4,600.00	230.00	4,370.00
Southbury,	2	200.00	..	....	..	....	2	200.00	10.00	190.00
Wallingford,	21	8,400.00	1	200.00	3	125.00	25	8,725.00	436.25	8,288.75
Waterbury,	138	52,880.00	20	3,365.00	19	880.00	177	57,125.00	2,856.25	54,268.75
Total,	824	$305,135.00	65	$11,300.00	115	$5,096.00	1004	$321,531.00	$16,077.55	$298,265.63
NEW LONDON CO.										
New London,	68	$18,500.00	1	$175.00	6	$250.00	75	$18,925 00	$946.25	$17,978.75
Norwich,	95	28,269.00	..	....	9	450.00	104	28,719.00	1,435.95	27,283.05
Bozrah,	2	184.00	..	....	..	....	2	184.00	9.20	174.80
Colchester,	11	1,100.00	..	....	1	50.00	12	1,150.00	57.50	1,092.50
Franklin,	2	200.00	..	....	..	....	2	200.00	10.00	190.00
Griswold,	..	...	..	....	1	12.00	1	12.00	60.60	11.40
Groton,	..	...	..	....	1	12.00	1	12.00	60.60	11.40
Preston,	3	300.00	1	50.00	..	....	4	350.00	17.50	332.50
Sprague,	5	459.00	..	....	..	....	5	459.00	22.95	436.05
Stonington,	31	6,732.00	1	63.00	4	86.00	36	6,881.00	344.05	6,536.95
							One license transferred,		2.00	
Total,	217	$55,744.00	3	$288.00	22	$860.00	242	$56,892.00	$2,846 60	$54,047.40

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* Paid police fund of New Haven, $7,188.82.

TOWNS.	LIQUOR LICENSES.		BEER LICENSES.		DRUGGISTS' LICENSES.		Total Number of Licenses.	Total Amounts Received.	Amount Paid County Treasurer.	Amount Paid Treasurer of Town.
	No.	Amounts Received.	No	Amounts Received.	No.	Amounts Received.				
FAIRFIELD CO.										
Bridgeport,	278	$101,850.00	13	$1,808.00	30	$1,368.00	321	$105,026.00	$,5251.30	$99,774.70
Brookfield,	1	100.00	. .	. . . .	. .	. . . .	1	100.00	5.00	95 00
Danbury,	54	20,431.00	. .	. . . .	12	600.00	66	21,031.00	1,051.55	19,979.45
Darien,	2	200.00	. .	. . . .	. .	. . .	2	200.00	10.00	190.00
Fairfield,	4	1,195.00	1	312.00	1	50 00	6	1,557.00	77.85	1,479.15
Greenwich,	24	8,559.00	2	337.00	2	100.00	28	8,996.00	449.80	8,546.20
Huntington,	2	189.00	. .	. . . .	2	24.00	4	213.00	10.65	202.35
New Canaan,	2	200.00	1	75.00	1	50.00	4	325.00	16.25	308.75
New Fairfield,	2	200.00	. .	. . . .	. .	. . . .	2	200.00	10.00	190.00
Newtown,	11	3,259.00	.	. .	1	50.00	12	3,309.00	165.45	3,143.55
Norwalk,	43	16,539 00	3	325.00	8	400.00	54	17,264.00	863.20	16,400 80
Ridgefield,	5	368.00	.	. . . .	. .	. . . .	5	368.00	18.40	349.60
Stamford,	56	19,669.00	3	325.00	9	450.00	68	20,444.00	1,022.20	19,421.80
Stratford,	2	200.00	2	80.00	1	50.00	5	330.00	16.50	313.50
Trumbull,	1	21.00	. .	. . . .	. .	. . . .	1	21.00	105.00	19.95
Westport,	8	3,164.00	. .	. . . .	1	50.00	9	3,214 00	160.70	3,053.30
Total,	495	$176,144.00	25	$3,362.00	68	$3,192.00	588	$182,598.00	$9,129.90	$173,468.10
LITCHFIELD CO.										
Litchfield,	1	$500.00	3	$450.00	3	$150.00	7	$1,100.00	$55.00	$1,045.00
Barkhamsted,	1	100.00	. .	. . . .	1	50.00	2	150.00	7.50	142.50
Canaan,	3	300.00	. .	. . . .	. .	. . . .	3	300.00	15.00	285.00
Cornwall,	1	100.00	. .	. . .	. .	. . . .	1	100.00	5.00	95.00
Kent,	1	100.00	. .	. . . .	. .	. . .	1	100.00	5.00	95.00
New Hartford,	4	2,000 00	. .	. . . .	1	50.00	5	2,050 00	102.50	1,947.50
New Milford,	6	3,000.00	. .	. . .	2	100.00	8	3,100.00	155.00	2,945.00
North Canaan,	. .	. . . .	. .	. . . .	1	12.00	1	12.00	.60	11.40
Plymouth,	. .	. . . .	. .	. . . .	2	24.00	2	24.00	1.20	22.80
Salisbury,	. .	. . . .	. .	. . . .	1	10.00	1	10.00	.50	9.50
Sharon,	3	300.00	. .	. . . .	. .	. . .	3	300.00	15.00	285.00
Thomaston,	5	2,500.00	3	600.00	2	100.00	10	3,200.00	160.00	3,040.00
Torrington,	10	4,750.00	. .	. . . .	3	150 00	13	4,900.00	245.00	4,655.00
Winchester,	3	1,500.00	. .	. . . .	5	250.00	8	1,750.00	87 50	1,662.50
Woodbury,	. .	. . . .	. .	. . . .	2	24.00	2	24.00	1.20	22.80
Total,	38	$15,150.00	6	$1,050.00	23	$920.00	67	$17,120.00	$856.00	$16,264.00

WINDHAM CO.										
Eastford,..	2	$160.00	..	....	..	....	2	$160.00	$8.00	$152.00
Killingly,................	.	....	..	....	4	$48.00	4	48.00	2.40	45.60
Plainfield,.....	..	....	..	....	2	24.00	2	24.00	1.20	22.80
Putnam, ...	..	....	..	....	3	36.00	3	36.00	1.80	34 20
Sterling,................	3	300.00	..	. ..	..	....	3	300.00	15.00	285.00
Thompson,..............	..	...	..	....	1	12.00	1	12.00	.60	11.40
Windham,...............	25	9,510.00	1	$200.00	7	350.00	33	10,060.00	503.00	9,557.00
Total,..............	30	$9,970.00	1	$200.00	17	$470.00	48	$10,640.00	$532.00	$10,108.00
MIDDLESEX CO.										
Middletown,.............	44	$14,883.33	3	$200.00	7	$350.00	54	$15,383.33	$769.16	$14,614.17
Chatham,................	..	....	..	...	1	12.00	1	12.00	.60	11.40
Clinton,.....	..	....	..	....	1	12 00	1	12.00	.60	11.40
East Haddam,............	6	500 00	..	. ..	..	...	6	500.00	25.00	475.00
Essex,..	..	....	..	....	1	12.00	1	12.00	.60	11.40
Old Saybrook, ...	6	475.00	2	79.17	..	....	8	554.17	27.70	526.47
Portland,................	11	4,066.66	..	....	1	12.00	12	4,078.66	203 93	3,874.73
Total,..............	67	$19,874,99	5	$279.17	11	$398.00	83	$20,552.16	$1,027.59	$19,524.57
TOLLAND CO.										
Coventry,........	..	....	..	....	1	$12.00	1	$12.00	$0.60	$11.40
Ellington,...............	2	$200.00	1	$25.00	..	....	3	225.00	11.25	213 75
Stafford,................	..	....	..	....	4	48.00	4	48.00	2.40	45.60
Vernon,..................	13	5,200.00	3	600.00	5	250.00	21	6,050 00	302.50	5,747.50
Total,......	15	$5,400.00	4	$625,00	10	$310.00	29	$6,335.00	$316.75	$6,018.25

SUMMARY.

COUNTIES.	LIQUOR LICENSES.		BEER LICENSES.		DRUGGISTS LICENSES.		Total Number of Licenses.	Total Amounts Received.	Amount Paid County Treasurer.	Amount Paid Treasurer of Town.
	No.	Amounts Received.	No.	Amounts Received.	No.	Amounts Received.				
Hartford, ...	395	$125,135.00	40	$5,838.00	73	$3,176.00	508	$134,149.00	$6,707.45	$127,441.55
New Haven, ...	824	305,135.00	65	11,300.00	115	5,096.00	1004	321.531.00	16,076.55	298,265 63*
New London, ...	217	55,744.00	3	288.00	22	860.00	242	56,892 00	†2,844.60	54,047.40
Fairfield, ...	495	176,144.00	25	3,262.00	68	3,192.00	588	182,598.00	9,129.90	173,468.10
Windham, ...	30	9,970.00	1	200 00	17	470.00	48	10,640.00	532.00	10,108.00
Litchfield, ...	38	15,150.00	6	1,050.00	23	920.00	67	17,120.00	856.00	16,264.00
Middlesex, ...	67	19,874.99	5	279.17	11	398.00	83	20,552.16	1,027.59	19,524.57
Tolland, ...	15	5.400.00	4	625.00	10	310.00	29	6,335.00	316.75	6,018.25
Total, ...	2,081	$712,552.99	149	$22,842.17	339	$14,422.00	2,569	$749,817.16	$37,493.84	$705,137.50

* Paid police fund, $7,188.82.

† License transfer $2.00 additional.

ANNUAL REPORT

OF THE

TRUSTEES

OF THE

STORRS AGRICULTURAL SCHOOL,

AT

MANSFIELD, CONN.

(P. O., STORRS, CONN.)

1891.

Printed by Order of the General Assembly.

HARTFORD, CONN.:
PRESS OF THE CASE, LOCKWOOD & BRAINARD COMPANY.
1892.

TRUSTEES.

HIS EXCELLENCY MORGAN G. BULKELEY, *ex officio, President.*

Appointed by the Board of Agriculture.

E. H. HYDE, STAFFORD, *Vice-President.*

Appointed by the Senate.

		Term expires.
T. S. GOLD,	W. CORNWALL, *Secretary.*	1893
HENRY C. MILES,	MILFORD, *Treasurer.*	1895
WM. E. SIMONDS,	CANTON,	1893
J. M. HUBBARD,	MIDDLETOWN,	1893
J. H. HALE,	SOUTH GLASTONBURY,	1895
E. C. PINNEY,	STAFFORD,	1895
PROF. S. W. JOHNSON,	NEW HAVEN, *ex officio, Director of the Connecticut Experiment Station.*	

EXECUTIVE COMMITTEE.

H. C. MILES, T. S. GOLD,
J. H. HALE.

AUDITORS.

E. C. PINNEY, J. M. HUBBARD.

OFFICERS OF THE SCHOOL.

B. F. KOONS, *Principal, Professor of Biology and Natural History.*
A. B. PEEBLES, *Professor of Chemistry and Physics.*
C. S. PHELPS, *Professor of Agriculture.*
MISS JOSEPHINE NETTLETON, *Instructor in Mathematics and English.*
L. P. CHAMBERLAIN, *Farm Superintendent.*
MRS. C. E. HILLIARD, *Matron.*

STATION STAFF.

W. O. ATWATER, *Director.*
C. D. WOODS, *Vice-Director and Chemist.*
C. S. PHELPS, *Agriculturist.*
H. M. SMITH, *Assistant Chemist.*
E. A. BAILEY, *Assistant Agriculturist.*

State of Connecticut.

REPORT.

To His Excellency Morgan G. Bulkeley, Governor of Connecticut:

As Secretary of the Board of Trustees of the Storrs' Agricultural School, I have the honor to present to you the Annual Report for the year 1891.

While much remains to be done before reaching the ideal upon which the Agricultural School at Mansfield was established, yet the substantial progress of the past year gives encouragement for its speedy attainment.

It was founded upon the plan of providing for the boys of Connecticut, taken right from the district schools of the State, an opportunity to acquire so much knowledge of agriculture, both practical and theoretical, and of the sciences which form the basis of all its work as could be taught in a period of two years. The developments and applications of science to the practical arts of life, but especially to agriculture, are advancing at a rate never before known in the world's history. Each year is witness to these triumphs, and agriculture can hold its place as the basis of all national wealth and prosperity only when its practical workers are able to grasp and apply the discoveries of science. It was believed that there were young men enough in Connecticut eager to embrace such opportunities to gain knowledge, to demand such an institution.

With the increased accommodations and consequent privileges, the roll of students is correspondingly increasing. The necessity for a new dormitory of the same size as the one recently built, and for which a place was provided in the location of the new buildings, is fully apparent. The new class-rooms are designed to accommodate twenty-five students each, with some larger for lectures. Two classes of twenty-five each would reasonably fill these rooms, making a total of fifty students, which was about as large a number as in our original ideal could be most advantageously educated in a farm school. We found in the progress of our work that some of our pupils had failed to improve all the advantages of the district schools, or had been deprived of them by circumstances, and we were obliged to provide instruction for a junior or preparatory class in arithmetic and other common studies. Taking these into account, and our class of thirteen which graduated in June, our catalogue shows a membership of sixty-three during the year 1891, a very gratifying result for ten years as proof not only that the school provides for an acknowledged want, but that the school is securing the confidence of the State, and that its demands for increasing means of support will be cheerfully granted to the full measure of its wants.

Among the notable events of the past year have been the furnishing and occupancy of the new dormitory, December 6, 1890, and of the main building December 2, 1891.

The boring for water continued to a depth of 850 feet through solid rock, when an abundant supply of pure water was obtained, which rose to within forty feet of the surface, yielding to pumping for ten hours from fifteen to forty-five gallons per minute without diminution of the supply, the contract requiring fifteen gallons per minute.

A permanent and abundant supply of water being thus assured, your building committee were instructed to erect a tower with windmill, pump, and tank. This work has been completed and we now have an abundant supply of water for all purposes, including very perfect arrangements for protection against fire. The same parties, Messrs. Smith & Winchester, who bored the well, erected the tower, windmill, tank, and other fixtures.

The tower is octagonal, twenty feet in diameter at base and forty feet to the bottom of the tank, which has a capacity of fifteen thousand (15,000) gallons.

The pumping apparatus consists of a 16-foot pumping airometer, wind engine, and an artesian well-pump having an artesian well-cylinder of 3¾ bore, made of brass, and placed one hundred and twenty-five (125) feet from the surface with twenty-five (25) feet of suction pipe on the lower end so as to enable the water to be drawn from a total depth of 150 feet from the surface. Frost-proof coverings are applied to the tank and pipes.

The frame work of the tower is of best hard pine and the covering of best cedar shingles. The tower stands in the rear of the main building on a wall laid in cement resting on the solid rock, the entire height being about 75 feet.

Considerable work has been done in grading about the new buildings, mostly by the students, under proper direction.

Some changes have been made in teachers: Prof. Chamberlain has been relieved from the duty of class-room instruction to devote his whole time to the care of the farm. To Prof. Phelps has been assigned the entire charge of class-room instruction in agriculture, with so much field teaching as he can bestow in connection with his duties to the Experiment Station. To enable him to perform those additional duties an assistant was given him in the work of the station.

Prof. A. B. Peebles, a graduate of the Michigan Agricultural College and assistant there, was called to take charge of the department of chemistry and physics, made vacant at the opening of the fall term by the resignation of Prof. Hutton.

The school is now fairly equipped in its corps of teachers, in its museum, and library, and its laboratories, and lecture-rooms, with apparatus to illustrate the different branches of science which pertain to agriculture, especially in the chemical department, which is provided with working tables for each student, where he may learn practically the properties and constitution of all material objects, and the laws which govern their varied combinations, both chemically and as living organisms. We are prepared to teach well all the student can learn both practically and theoretically in his two or three years' course; but we must admit the weight of the opinion of our teachers that they could do better work, more satisfactorily to themselves, with a still fuller equipment. Our plan comprehends in the near future increased facilities for practical instruction in carpentry and repair of tools, a wider field of study in the culture and varieties of fruits, flowers, vegetables, grains, and forage crops, especially through the work of the Experiment Station, an increase of apparatus to illustrate the discoveries and practical applications of modern science, while the interest in live stock and dairy management surely demands increasing study to insure the best results; and lastly, we name the library, which should have a sufficient appropriation to present on its shelves to the inquiring student, not only the latest results of scientific research, but also, in full, the economical and political history of the world.

These are things to be secured by growth. It would have been presumptuous to have sought them all at once however desirable they might have seemed, but now their claims are pressing, and here we only voice the sentiment of our teachers, which meets our hearty response, and of all intelligent citizens who have taken the pains to investigate the work the Storrs School is now doing.

The terms and privileges of the Storrs School invite comparison with those of any other institution in preparing young men for their life work. The terms for tuition are twenty-five dollars per year, which is remitted in worthy cases. Furnished rooms are free; no charge for chemicals and apparatus in the laboratory, except breakage. Board, including fuel, lights, and washing, is provided at cost. No charge is made for use of library, reading-room, and transportation of baggage to and from Eagleville. All the students are required to work a certain number of hours daily, and except when this work is especially designed for instruction they receive as compensation eight cents an hour. Special opportunities are given those who desire to work extra hours, so that some students earn enough to meet nearly or quite all their expenses.

For further particulars reference is made to the report of the principal containing reports from those in charge of each department, calendar, catalogue of students, course of instruction, list of text-books, commencement exercises, list of prizes awarded, the alumni association, winter course of lectures, library, reading-room, inventory, school expenses, labor of students, boarding department, farm inventory, farm and garden products, permanent improvements, balance sheet of farm, and report of treasurer.

Respectfully submitted,
T. S. GOLD,
Secretary.

To the Board of Trustees :

I have the honor herewith to submit to you the report of the Storrs School, for year ending Nov. 30, 1891.

Very repectfully,
B. F. KOONS.

REPORT OF PROFESSOR PEEBLES.

To the Trustees of Storrs Agricultural School:

Gentlemen, — The work in the Department of Chemistry and Physics has been along the lines marked out in the regular course. A fair equipment for work in chemistry, supplemented by apparatus devised by the class, has enabled the Senior students in organic chemistry to perform the operations given in the text-book, the time being about equally divided between recitations and laboratory work. A beginning in quantitative analysis has been made, which will lead on during the year to the analysis of agricultural products, fertilizers, soils, water, and food stuffs.

The class have nearly finished geometry, and later will take up trigonometry, preparatory to work in surveying and leveling.

One hour a week is devoted to the study of English and rhetorical work.

The Middle Class has finished the course laid down in the text-book on elementary chemistry. One day of each week has been employed in manipulations, laboratory work, making gases, and determining their properties. A short course in blow-pipe has been completed.

In physics the usual course is being pursued. No laboratory work has been possible in this subject for lack of apparatus. Not the best instruction is possible with the very meagre appliances at hand. As the time the young men have here is short, it is specially desirable they should have the very best opportunity possible to gain a practical working knowledge of the subjects considered.

A brief course of lectures on Landscape Gardening has been given the Middle Class. The hope is to awaken an interest in the subject of home adornment, ornamental gardening, tree planting, shrubbery, laying out of walks and drives. Practical application has been given the subject by making such a start in collecting and transplanting native trees and shrubs as the season would allow. Six weeks in physiology and hygiene completes the course on this subject. A text-book was followed. A few models would assist very much in the study of this important topic.

The further work of the year will follow the revised course as laid down in the schedule of studies.

Very respectfully submitted,

A. B. PEEBLES,

Department of Chemistry and Physics.

REPORT OF PROFESSOR PHELPS.

To the Trustees of Storrs Agricultural School:

GENTLEMEN, — Early in the present year your Board saw fit to enlarge my duties in the School. The Executive Committee of the Station, at the same time, relieved me of the details in the management of the agricultural work of the Station by the appointment of Mr. E. A. Bailey as Assistant Agriculturist. By this change the class-room instruction in agriculture is brought entirely under my charge, thereby affording opportunity for arranging a course of instruction covering the entire time of the regular school course.

The schedule of studies will be found in another part of this report. The course as now arranged for middle year covers, first, a brief history of agriculture, ancient and modern, the arrangement of farm buildings and fields for convenience and economy, rotation of crops, etc.; second, soils, tillage, and manures; and, third, farm crops, their cultivation, value, and uses. During senior year the class takes up, first, stock-breeding and breeds; second, cattle-feeding and dairying; and, third, a study of fertilizers in their relations to soils and crops. For the spring term of senior year there has been added a study of fruit culture.

The importance of fruit growing, as a profitable branch of New England agriculture, becomes more noticeable year by year. The constantly increasing demand for fresh fruits in our home markets, and the adaptability of this branch of farming to our soils and climate, bespeak the importance of making horticulture a prominent feature in our course of instruction. In order to make the work in horticulture of a thoroughly practical nature, it would seem advisable that a portion of the farm be devoted to a fruit garden, where a large assortment of fruits could be grown on a more or less extensive scale. Most of the work of setting out and caring for the trees, shrubs, vines, and other plants could be done by the students as class-work. Some work in grafting, pruning, and transplanting has already been undertaken, and will be enlarged as far as facilities will allow.

Much interest has been aroused in the senior classes during the past two years by the offer of prizes for essays on some subject relative to dairying, together with an oral examination on the agricultural work covered during the course. The gift was the generous offer of the Connecticut Dairymen's Association, and consisted of twenty-six dollars in gold, divided into prizes of fifteen, eight, and three dollars. The Alumni Association also offered prizes of ten and five dollars for the best examinations in "practical agriculture." It is confidently hoped that the offering of prizes will be continued. It excites a healthy spirit of competition among the students, and by the public examination affords the people of the State an opportunity of judging our work. The Alumni prizes are to be continued, and the coming year (1892) the oral examination is to be public, and will be held the morning of commencement day, the entire class being required to participate. Prizes for the best essays on some subject related to dairying will also be offered if the funds can be obtained.

The work of the Experiment Station has been made of value to the students as far as seemed possible. The work of experiment stations is explicitly outlined in the act of Congress under which they were established, and in no case can the funds be legitimately used for purposes of instruction. Work is afforded the students as far as seems advisable, and the field and grass garden experiments in progress cannot fail to be of value to the observing student.

A collection of implements and models, together with series of charts, are greatly needed to facilitate class-room instruction. By a small expenditure of funds, the work of the course could thus be greatly aided. Collections of seeds and dried specimens have already been started, and will be enlarged as rapidly as possible. Gifts of uncommon seeds and plants, suitable for a museum collection, or for planting in the grass garden, will be very acceptable from any source, and may be forwarded to my address, Storrs Agricultural School, Storrs, Conn., or by express to Eagleville

Respectfully submitted,

C. S. PHELPS.

REPORT OF MISS NETTLETON, TEACHER.

To the Trustees of Storrs Agricultural School:

GENTLEMEN, — In reviewing the work of my department during the year just closed, the result seems more satisfactory than at any similar period since my connection with the school.

A sense of justice compels me to add, that this is not due alone to effort on the part of the writer, but also to the hearty co-operation of those whom it has been my pleasure to meet in the recitation-room. Not that the accomplishment of everything sought has been attained, for

> "Labor with what zeal we will,
> Something still remains undone."

More and more is the truth realized, that "here is a field worthy of every effort." By repeated precept and example, does our worthy Principal remind his colleagues that duties to those under their supervision are not restricted to the recitation-room.

At the beginning of the year, three young ladies residing in this vicinity sought and obtained permission to enter the Junior Class for daily recitations; an innovation not unwelcomed by those friends of the institution who hope the time not far distant when young women may be admitted as regular members of Storrs School.

As may be learned by reference to the schedule, the study of arithmetic is pursued throughout the school year. A knowledge of practical arithmetic is not only invaluable to the student, but indispensable to the man of business. As a means of acquiring this, careful and thorough preparation of work assigned is required previous to the hour of recitation.

Algebra is taught the Middle Class the last two terms. Owing to increased demands upon time for recitations, Prof. Hutton kindly came to the rescue, so that during the spring term the class was under his instruction.

ENGLISH.

The methods of instruction to the Junior Class consisted of recitations from text-book, correction of exercises in false syntax, study of synonyms, practice in letter-writing, reproductions of selections read in class, and practice in original composition.

The limited time allowed the other classes, viz., one hour per week, forbade more than regular practice in composition. In this line, however, marked improvement was noted, and creditable work accomplished by the majority of students.

Two evenings in each term rhetorical exercises were given by the students; these were found to be not only of profit to those who took part therein, but, judging from the presence and courteous attention of others, of sufficient interest to call them for an evening from their homes.

The study of physical geography is taken up at the beginning of the year, and continued until such time in the winter term as is necessary to have considered the subjects treated of in text-book; after which, history receives attention until the end of the year.

BOOKKEEPING.

Only the method of single entry is taught; but the aim is to prepare the student to keep accounts with accuracy. Besides examples found in text-book, those of a practical nature, showing gain or loss in productions of farm products, are considered.

In addition to what has been mentioned, regular attention is given to work in library and assistance in keeping school accounts.

Respectfully submitted,

J. NETTLETON.

REPORT OF L. P. CHAMBERLAIN, FARM SUPERINTENDENT.

To the Trustees of Storrs Agricultural School:

THE FARM.

The Storrs School farm, comprising about one hundred and seventy acres of diversified soil, and of a decidedly undulating surface, may now be regarded as having become fairly productive, when measured by the standard of our well-improved Connecticut farms ; but when measured by the truer standard of its possible productiveness, even within the limits of profitable cultivation, its products by no means justify such a claim. Nearly all those lands that are naturally suited to the growth of hay or cereals and other annual crops have been improved by cultivation and by fertilization. More than forty acres are now entirely free from boulders and all other obstructions to easy cultivation. The smaller stones, which abound in most of the upper soil, but do not penetrate the subsoil to a troublesome extent, have also been quite thoroughly removed, thus greatly lessening the danger from impatience in cultivation, as well as the cost of growing all cultivated crops. Quite likely no more remain in many fields than are needed in the soil to preserve its texture, temperature, and moisture. Enough has been done in the line of mechanical improvement and partial fertilization to greatly increase the live stock of the farm. This gives additional manurial resources, and warrants the adoption of a much more liberal system of cropping than that of the past. The better utilization of the corn crop, through the silo, has largely contributed to the increase of dairy products, and to make their production a source of increased profit. Little has been done to improve the pasture lands, beyond the cutting of bushes, to prevent their complete occupancy of the depleted soil.

LABOR.

As no assistant farmer has been employed since July, 1890, and the working force of students has been smaller than usual during the past year, less has been attempted in the way of permanent improvements upon the farm than during the preceding years. To this should be added the fact that the hours during which each student is required to labor has been reduced from five to three, and for the Senior Class, during the spring term, to the still narrower limit of two hours. This small amount of labor has been shared about equally with the Experiment Station during the forenoon of each day, thus reducing the amount of labor furnished by the Senior Class to six hours upon the farm, daily. From this it will be readily seen that while the principal object of the student has been promoted, the work of the farm has suffered, and its possible products lessened. During the summer months, two only of the students remained to assist in the farm work. This necessitated the employment of day labor to a limited extent during haying and harvest. On the whole, the cost of farm labor has been lessened, while its aggregate products have considerably increased. The work of the average student has been fairly efficient. The fact is noticeable that those who excel in the class room, those with whom improvement is the dominant purpose and the steady aim, are also the reliable and efficient helpers in the work of the farm. There are but few exceptions to this rule.

GRADING.

As soon as practicable after the opening of the fall term, and the necessary work of harvesting was completed, the improvement of the grounds about the new school buildings was begun, and has been steadily prosecuted till the present time. A strong force has been employed, and a large amount of earth has been removed. Only such work has been done as was plainly necessary in any future layout of the grounds that may be adopted, and was needful, mainly, to protect the buildings from inflowing water. A considerable part of the subsoil removed has been used to fill the rocky and useless ravine in the rear of the buildings, and so to hide a natural deformity, and to add another acre to the productive area of the farm. This work is unfinished, but enough material remains to complete it. A large amount of labor has been expended in blasting and removing rocks, and in bringing the surface to such a level that it could be covered at a uniform depth of about six inches, but this outlay seems to be fully justified by the improvement already accomplished.

POULTRY.

Owing to the lack of suitable accommodations, but little has been done in breeding or the production of eggs. It is believed, however, that both of these industries may be made profitable, as well as instructive to all students who care to know how to manage poultry successfully. A new building has been erected at a very moderate cost, fifty feet in length, and divided into five compartments, with ample yard room, for one hundred hens. A number of different breeds may be kept for the purposes of comparison as to their value in the production of meat or eggs.

The location selected is at a suitable distance from the buildings, is sheltered from cold winds, and has a warm southern exposure.

CROPS.

Hay excepted, all our staple crops have been abundant, and of a superior quality.

Corn has reveled, throughout the entire season, in almost all those natural conditions that induce perfect growth and maturity. About four acres were grown, and a glance at the table of farm products will show with what results.

Oats, which last year were so nearly ruined by a universal blight, have this year produced heavily both of straw and grain. No signs of the blight appeared upon the early crop, though upon a second crop in the same field, grown for late forage, it was as marked and destructive as before. This is a broad hint that the scourge has come to stay with us, and only requires peculiar conditions for its future development.

Potatoes have yielded well, and their quality is excellent. Only a few have decayed, and only the white varieties have suffered at all.

Buckwheat has yielded largely. Fourteen quarts of seed sown on one acre of well fertilized soil produced nearly forty bushels of grain of the highest quality. This grain deserves better treatment than it receives.

Our hay crop, as will be seen by reference to the table given below, has been less than that of last year, but the shrinkage relates more to bulk or weight than to its nutritive or feeding value, and was owing to unfavorable climatic conditions alone.

But few roots are grown beyond the needs of the boarding department of the school. Silage, of equal value, can be grown much more profitably. Our garden products, in great variety, have been plentiful and have matured in the greatest perfection. Great care is used in selecting the most approved varieties of all these products.

REPORT OF THE MATRON.

To the Trustees of Storrs Agricultural School:

GENTLEMEN, — In compliance with your request, I present to you the following report of the work under my direction.

The most important event at the beginning of the fiscal year, Dec. 1, 1890, was the opening of the rooms in the new dormitory for the occupancy of the students, who, on the 6th of December, enthusiastically took possession. The removal of the students to the new dormitory, while the boarding department remained in the old building, added greatly to the work and care of the matron. It was supposed at that time that the boarding department would soon be transferred to new rooms in the main building. Dec. 1, 1891, we were still in our old quarters, but removed the following day.

Ample furnishings for the boarding department have been provided by the committee appointed to procure needful outfit for the main building. Many thanks are due this committee, as well as Mrs. Gold and Mrs. Hale, for interest manifested in the judicious selection of furnishings which give the rooms an air of home-like comfort. Especially do we appreciate the tasteful and appropriate equipments for the dining-tables.

At the commencement in June, we opened the house to friends of the class of '91, also to former students and graduates. Entertainment was furnished to more than one hundred and fifty guests, testing to the utmost our accommodations in the old building.

In making preparation for the school year, beginning Sept. 21, 1891, besides the new dormitory, all the available rooms in the old building were put in readiness for the use of students, every one of which is occupied.

During the summer about seven hundred quarts of fruits obtained from our own garden and elsewhere, were prepared and preserved for future use in boarding department. The stock of bed and table linen, table and kitchen furnishings, so generously replenished by the committee, are in better condition than at any time since my connection with the school.

As usual, the price of table board has varied from term to term. The average price during the year has been $2.52 per week.

As nearly as I have been able to ascertain, the supplies received from farm and garden during the year are as follows:

3,326	quarts new milk.
3,211	" creamery milk.
372½	" cream.
21½	doz. celery.
45½	lbs. chicken.
37	cabbages.
100	bush. potatoes.
2,355	lbs. beef.
900	lbs. butter.
80	heads lettuce.
150	lbs. rhubarb.
60	lbs. asparagus.
54	quarts strawberries.
81	" currants.
185	" raspberries.
8	" cherries.
8	bushels apples.
4½	" onions.
1¼	" beans.
25½	doz. sweet corn.
2½	bush. cucumbers.
6½	" pears.
2½	" turnips.
300	lbs. squashes.
1	bush. peppers.
2½	" parsnips.
15	" grapes.
1,481	lbs. pork.
17	bush. tomatoes.
2½	" beets.
5	" peas.

Respectfully submitted,

CATHARINE E. HILLIARD.

CALENDAR.

1891.

Winter Term began January 5th. Spring vacation, March 28th to April 5th. Spring Term began April 6th. Tenth Annual Commencement, June 19th. Fall Term began September 21st. Christmas vacation, December 19th to January 3d, 1892.

1892.

Winter Term begins January 4th. Spring vacation, March 26th to April 3d. Annual Commencement June 17th. Fall Term begins Monday, September 26th.

All communications should be addressed not to individuals, but to the Storrs Agricultural School; also, all bills should be made against the school instead of the purchasing officer.

CATALOGUE OF THE STUDENTS FOR THE YEAR 1891.

C. G. Allyn,	Hebron, Tolland Co.
H. L. Andrews,	Deep River, Middlesex Co.
E. S. Backus,	Andover, Tolland Co.
A. M. Baker,	Andover, Tolland Co.
F. O. Barrows,	Mansfield, Tolland Co.
E. T. Beard,	Milford, New Haven Co.
W. H. Bishop,	Clintonville, New Haven Co.
G. S. Bowen,	Eastford, Windham Co.
C. Brimble,	Torrington, Litchfield Co.
S. H. Buell,	Plymouth, Litchfield Co.
H. P. Cadwell,	Hartford, Hartford Co.
C. V. Chandler,	South Windsor, Hartford Co.
E. G. Chesbrough,	Scotland, Windham Co.
A. H. Clark,	East Morris, Litchfield Co.
G. E. Colburn,	Mansfield, Tolland Co.
W. E. Cummings,	Spring Hill, Tolland Co.
F. W. Darnstaedt,	Hartford, Hartford Co.
W. B. Dayton,	Plantsville, Hartford Co.
D. Dunivan,	Hartford, Hartford Co.
J. Dunivan,	Hartford, Hartford Co.
W. M. Dunivan,	Hartford, Hartford Co.
C. W. Eddy,	Simsbury, Hartford Co.
A. W. Fenn,	Plymouth, Hartford Co.
R. C. Fenton,	Willimantic, Windham Co.
G. L. Fish,	Mansfield, Tolland Co.
E. B. Fitts,	E. Windsor Hill, Hartford Co.
J. S. Fowler,	Pomfret Center, Windham Co.
H. E. French,	Hartford, Hartford Co.
W. J. Frey,	Suffield, Hartford Co.
J. C. Frisbie,	Southington, Hartford Co.
M. M. Frisbie,	Southington, Hartford Co.

A. H. Griswold,	New Britain, Hartford Co.
J. J. Guildford,	West Winsted, Litchfield Co.
C. T. Guildford,	West Winsted, Litchfield Co.
A. G. Hall,	Meriden, New Haven Co.
G. H. Hall, Jr.,	Manchester, Hartford Co.
H. C. Harrison,	Northford, New Haven Co.
W. Holden,	Norwich, New London Co.
K. K. Kimberly,	W. Torrington, Litchfield Co.
R. C. Kolb,	South Coventry, Tolland Co.
T. A. Mack,	Andover, Tolland Co.
H. G. Manchester,	West Winsted, Litchfield Co.
G. H. Merwin,	Westport, Fairfield Co.
G. Oehlers,	Chestnut Hill, Fairfield Co.
F. C. Osborn,	Litchfield, Litchfield Co.
M. H. Parker,	South Coventry, Tolland Co.
M. J. Phelps,	Mansfield, Tolland Co.
H. V. Phelps,	Mansfield, Tolland Co.
F. Rosebrooks,	Mansfield, Tolland Co.
W. L. Rosebrook,	Mansfield, Tolland Co.
L. J. Rosebrook,	Mansfield, Tolland Co.
W. F. Schults,	Hartford, Hartford Co.
C. H. Schults,	Hartford, Hartford Co.
G. O. Smith,	South Willington, Tolland Co.
A. M. Snow,	Mansfield, Tolland Co.
H. G. Sperry,	Bolton, Tolland Co.
H. W. Sweet,	Lebanon, New London Co.
C. H. Vibert,	Meriden, New Haven Co.
T. H. Ward,	Bristol, Hartford Co.
H. E. Warner,	East Haven, New Haven Co.
W. A. Warren,	South Coventry, Tolland Co.
N. L. Wilson,	Mansfield, Tolland Co.
A. R. Yale,	Meriden, New Haven Co.

Whole number of students, ...	63
Number of graduates since the organization of the school,	77

COURSE OF INSTRUCTION.

JUNIOR YEAR.

Arithmetic,	Continued through the year.
English,	
United States History,	
Physical Geography,	
Mechanical Drawing,	

MIDDLE YEAR.		SENIOR YEAR.
Agriculture, English, Elementary Chemistry, Blowpipe, Anatomy of Domestic Animals, Landscape Gardening, Human Physiology, Physics.	Fall Term,	Stock-Breeding, Entomology, Organic Chemistry, Physiological Botany, Geometry, English.
Agriculture, Chemical Analysis, Botany, Zoölogy, Algebra, English, Physics.	Winter Term,	Dairying, Cattle Feeding, Qualitative Analysis, Political Economy, Zoölogy, English, Trigonometry.
Agriculture, English, Mechanical Drawing, Algebra, Meteorology, Zoölogy, Chemistry, Book-keeping.	Spring Term,	Horticulture, Agriculture, Agricultural Chemistry, Geology, Surveying, Botany, English, Science of Government.

Questions like the following are often asked concerning the School :

Just what are its objects or aims ?

What does it teach ?

What is the expense of each pupil?
Who can attend?
What are the conditions of admission? etc.

As to the objects of the School, it aims to give to its pupils such an education as is best suited to their *real needs;* such as will be most useful to them in the line of their life work. In the educational systems of the past all classes were expected to pursue the same course of study, all minds were cast in the same mould, and and in these systems—especially if the pupil passed beyond the three R's—Latin and Greek, and many other things quite useless to the industrial classes, occupied a very large part of the time. These ancient systems are giving place to others more nearly adapted to the *real needs* of those who take them. The surveyor studies those things that lie in the line of his life work, he gets an education that will fit him for his calling.

The doctor has a course of study suited to his needs; the engineer, instead of filling his brain with the principles of the dead languages, disciplines his powers and stores his mind with facts that will be useful to him in real life. So it is believed that there is a wide field of knowledge that is important, if not absolutely necessary, to the highest success of agriculture. No calling requires a wider range of information, gives an opportunity for the exercise of a wiser discrimination or a keener judgment, than that of the true agriculturist.

Also conditions are rapidly changing, new problems are constantly forcing themselves upon the wide-awake farmer; blight, mildew, rust, ravages of new insect enemies, new and labor-saving machinery, more economical and better fertilizers, better methods of using them, best varieties of a multitude of farm crops and how best to grow them, so that a general knowledge of all these subjects is needed, in order that he may be reasonably sure of success.

As to what is being taught; agriculture in all of its branches, and the closely allied sciences, together with English, occupy nearly the entire time of the course. Under the subject of agriculture,—first, a knowledge of the history and progress of agriculture is thought necessary as a foundation. The agriculture of ancient countries is reviewed briefly; followed by the history of

English agriculture, and concluding with the history and development of the agriculture of our own country.

Soils. Early in the course is taken up the study of soils, their origin, classification, chemical and physical properties, and their improvement by means of drainage, tillage, etc. This branch of the subject naturally includes manures and all home and commercial supplies of fertilizing materials.

Farm Crops. By study in the class-room and on the farm the student gets a general knowledge of farm plants ; their origin, relative importance and value ; their adaptation to soils and climates, and the best modes of cultivation.

Horticulture. A course in Horticulture has been recently added, Maynard's "Practical Fruit Grower" being found a valuable help. Instructive work is given the class as far as circumstances will allow. Grafting, pruning, transplanting, and the preparation and use of insecticides and fungicides, are included in this work.

Farm Animals. A large part of Senior year is occupied with a study of Stock-Breeding, the care and management of live stock and their products.

Chemistry receives much attention, the work extending well through two years, because the science enters so largely into every-day life on the farm ; its principles being extensively employed in the selection of commercial fertilizers and the wisest and best use of these and the home produced ; the kinds of soil to which they are applied and the crops they are to grow ; also into the business of feeding and rearing animals, hence the chemistry of feeding and food stuffs, and the principles of the science as employed in the dairy.

Geology. As a knowledge of soils, their origin and composition, restoration and fertilization, is of prime importance; the study of Geology is necessitated.

Botany. And since plants enter so largely into the subject of feeding and food of farm animals and dairying, also farm products in general, considerable time is devoted to the principles of Botany, —the anatomy, physiology, and chemistry of plants. Also the lower forms of plant life, such as bacteria, blights, rusts, smuts, and molds, are studied.

The Animal Kingdom is studied, more particularly those parts most intimately related to the farm; namely, the anatomy and physiology of the domestic animals; and insect pests of the farm, orchard, and garden, and the best methods of checking their ravages.

Human Physiology and **Hygiene,** or the laws of health, receive a reasonable amount of time.

In Physics are studied the laws of electricity, magnetism, sound, light, heat, the atmosphere, mechanical powers, steam engine, etc.

In Mathematics, if the students have not already mastered it, Arithmetic is first completed, and then a brief course is given which leads up to the principles of leveling and land surveying.

English. The students receive at least one lesson a week, throughout the course, in essay writing, declamation, and public speaking; the pupils occasionally having an exercise before the whole School.

Expenses. No charge is made for furnished rooms. Tuition is $25.00 a year, but those who are in limited circumstances and show themselves worthy, can have it remitted. Text books, table board, washing, fuel and lights, are furnished at cost. The whole expense per year, exclusive of tuition, averages about $120.00 or $125.00.

Pupils are required to spend three hours a day at manual labor on the farm, for which, and extra labor, they are allowed eight cents per hour, so that they earn from twenty-five to seventy-five, or even one hundred dollars a year, which is credited upon their bill of expenses.

According to the Act of the General Assembly establishing the School, "Boys whose parents are citizens of the State," can be admitted.

As to conditions of admission, those who can pass a satisfactory examination in common school Arithmetic, Geography, English, and United States History, can complete the course in two years; those who need further drill in these must take three years for it.

LIST OF TEXT-BOOKS USED.

Johnson's How Crops Grow.
Armsby's Cattle Feeding.
Miles' Stock-Breeding.
Steele's Inorganic Chemistry.
Remsen's Organic Chemistry.
Kedzie's Qualitative Chemistry.
Thorpe's Quantitative Chemistry.
Martin's Human Body.
Gray's Lessons and Manual of Botany.
Maynard's Practical Fruit-Grower.
Dana's Text-Book of Geology.
Scott and Morton's Soil of the Farm.
Steele's Physics.
Bradbury's Arithmetic.
Wentworth's Algebra.
Wentworth's Geometry.
Wentworth's Trigonometry.
Wentworth's Surveying.
Hyde's Lessons in English.

Also a considerable number of books of reference from the school library.

Two changes have been made in our corps of instructors during the year. April 1st Professor Chamberlain was relieved from his class-room duties that he might have his entire time to superintend the farm, and all the class-room instruction in agriculture was placed in charge of Professor Phelps.

Also Professor Hutton resigned his position as chemist, at the close of the school year in June, and Prof. A. B. Peebles, a graduate of, and for some years an assistant in, the chemical department Michigan Agricultural College, was secured to take his place.

The Annual Commencement was held in June, at the close of the school year, when the following programme was presented by the graduating class of thirteen young men :

COMMENCEMENT EXERCISES, JUNE 19TH.

PRAYER.

Music.

H. P. Caldwell, - - - - - - - Hartford
"Market Gardening."

* C. V. Chandler, - - - - - South Windsor
"Bees."

* W. E. Cummings, - - - - - - Mansfield
"Wastes and Wants of the Farm."

J. S. Fowler, - - - - - - Pomfret Centre
"Poultry Keeping in New England."

* J. C. Frisbie, - - - - - - Southington
"Division of Labor."

* A. H. Griswold, - - - - - - New Britain
"Pear Culture."

* A. G. Hall, - - - - - - - Meriden
"The Colorado Potato Beetle."

H. G. Manchester, - - - - - West Winsted
"The Farmer as a Business Man."

Music.

G. H. Merwin, - - - - - - - Westport
"The Boy's Defense."

Fred Rosebrooks, - - - - - - Mansfield
"Time and Opportunities Wasted by the Farmer."

* W. L. Rosebrooks, - - - - - - Mansfield
"The History of Agriculture in the United States."

* C. H. Vibert, - - - - - - - Meriden
"The Culture of Small Fruits."

A. R. Yale, - - - - - - - - Meriden
"Science in Agriculture."

Music.

Address, - - - - Hon. Mortimer Whitehead

Music.

Awarding of Prizes.

Conferring of Diplomas.

Prizes amounting to $26.00 in gold, the first $15.00, second $8.00 and third $3.00, were given by the Connecticut Dairymen's

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* Excused from Reading.

Association, to the members of the graduating class, for the best essays upon "The Care and Management of Dairy Stock," and passing the best oral examination upon the general subject of Agriculture.

George H. Merwin, won first prize ; Jas. S. Fowler, second, and H. G. Manchester, third.

The Alumni Association gave two prizes, $10.00 and $5.00, for the best oral examination on Practical Agriculture.

H. G. Manchester, first, and C. H. Vibert, second.

The prize of $15.00 is again offered by the Alumni Association to the members of the class of '92, and it is hoped that the Dairymen's Association will renew their offer also.

The Alumni Association is composed of the graduates of the school, and the annual meeting is held on Commencement Day at the school. The object of the Association is to cultivate fraternal relations, and for mutual improvement ; also to work for the highest interests of the school. The present officers of the Association are :

DR. ANDREW HYDE, President, Norwich.
J. B. PERRY, Secretary, Clark's Falls.
M. CHAPMAN, Treasurer, Center Groton.

The students maintain a branch of the Inter-Collegiate Young Men's Christian Association, and the influence going out from this organization does much to elevate the moral tone and develop a manly bearing among them.

The Winter course of Friday night lectures, for the benefit of the students and all others who may choose to avail themselves of them, was continued as usual, with the following list of subjects, the lecturers giving their services :

Jan. 16th. Prof. H. W. Conn, of Middletown, Conn., "Bacteria."

Jan. 30th. Rev. Leonard Smith, of Spring Hill, Conn., "Pots and Potters;" a description of a visit among the pottery industries of England.

Feb. 20th. Attorney W. A. King, of Willimantic, Conn., "Equalization of Taxation."

April 17th. Prof. A. W. Harris, of Washington, D. C., "The Aims of the United States Department of Agriculture."

May 25th. Prof. C. D. Woods, of the School Ex. Station, "The Fuel Value of Feeding Stuffs."

THE LIBRARY

Now contains over 1,600 books and pamphlets, acquired by gift and purchase. With new accommodations it can be much enlarged to advantage. More books for reference in the various lines of study are needed. If not furnished by the State, may we not hope that some liberally-disposed persons will supply our want?

READING-ROOM.

The reading-room is supplied with a considerable number of the leading agricultural papers of the United States, besides the most important daily and weekly papers of the State ; almost exclusively the gift of the publishers.

INVENTORY.

Office,	$21.00
Library,	1,300.00
Physical and chemical apparatus and chemicals,	1,150.00
Natural history outfit,	145.00
Household furniture and outfit,	2,100.00
Kitchen furniture and outfit,	250.00
Provisions on hand,	122.00

Tons of coal, 145.

SCHOOL EXPENSES.

Text-books,	$291.56
Books for library and stationery,	142.08
Printing,	64.20
Chemicals and apparatus,	273.29
Repairs on buildings,	51.56
Telephone,	36.15
Postage,	33.99
Freight and express,	105.21
Traveling expenses,	53.41
Other supplies,	40.00

LABOR OF STUDENTS.

Farm labor, 9,521¼ hours, at 8c.,	$761.90
Permanent improvements, 392⅛ hours,	31.37
For school, 1,021 hours,	81.68
For boarding department, 1,754¾ hours,	40.38

For buildings, 887¼ hours,	$70.98
For grading, 701 hours,	56.08
For experiment station, 1,220⅜ hours,	97.63
Total amount earned by the students at all kinds of labor during the year,	$1,140.78

Also a considerable amount of labor has been done by the students for parties living in the vicinity of the school, and for which they received the cash, hence is not included in the above summary.

BOARDING DEPARTMENT.

Provisions :—	
Beef and pork,	$578.33
Fish and Oysters,	162.56
Flour,	155.15
All other,	1,384.16
Fuel and lights,	2,095.79
Dormitory and kitchen outfit,	240.30
Repair of buildings,	236.20
Other purchases,	42.68
Servant hire,	888.30
Matron,	400.00
Other labor,	71.50

INVENTORY OF LIVE STOCK ON FARM NOV. 30, 1891.

CATTLE.

1	pair of working oxen,	$120.00
11	grade cows and heifers,	330.00
2	thoroughbred Guernsey cows,	200.00
6	half-blood Guernsey heifers, 2 years,	150.00
2	half-blood Guernsey heifers, 1 year,	40.00
4	half-blood Guernsey calves,	50.00
1	full-blood Jersey calf,	15.00

HORSES.

1	pair of farm-horses,	400.00
2	driving-horses,	150.00

SWINE.

2	fat hogs,	36.00
1	breeding sow,	15.00
2	shoats,	16.00

POULTRY.

38 Plymouth Rock chicks,	$22.80
6 fowls,	3.00
	$1,547.80

FARM IMPLEMENTS ON HAND NOV. 30, 1891.

Aggregate valuations,	$800.00
Quarry, joiners, and all other tools,	39.00
	$839.00

AMOUNT AND VALUE OF FARM AND GARDEN PRODUCTS.

47	tons of upland hay,	$564.00
1	ton of rowen hay,	12.00
6	tons of swamp hay,	36.00
5	tons of oats straw,	40.00
1	ton of rye straw,	12.00
2	tons of bedding,	8.00
1	ton of corn fodder,	10.00
50	tons of silage,	125.00
$\frac{3}{4}$	ton of squashes,	30.00
432	bushels of ears of corn,	172.80
12	bushels of parsnips,	6.00
15	bushels of table beets,	9.00
5	bushels of onions,	3.00
25	bushels of turnips,	5.00
20	bushels of tomatoes,	12.00
3	bushels of pickles,	3.00
10	bushels of pole beans,	7.50
183	bushels of potatoes,	91.50
5	bushels of sweet corn,	3.75
290	bushels of oats,	145.00
39	bushels of buckwheat,	27.30
16	bushels of spring rye,	12.00
8	bushels of pease,	8.00
15	barrels of apples,	15.00
5	bushels of pears,	5.00
12	bushels of grapes,	12.00

500 heads of celery,	$10.00
200 cabbages,	10.00
2 bushels of peppers,	2.00
250 heads of lettuce,	5.00
500 pounds of rhubarb,	5.00
60 bushels of asparagus,	9.00
84 quarts of strawberries,	8.40
219 quarts of raspberries,	21.90
5,715 gallons of milk,	685.80
1,481 pounds of pork,	88.17
4,085 pounds of beef,	228.83
120 pounds of veal,	6.00
43 cords of wood,	172.00
4 calves raised,	50.00
Swine raised,	16.00
Poultry raised,	16.00
	$2,716.95

LABOR ON PERMANENT IMPROVEMENTS.

Grading around new school buildings :—	
Labor of students, 1,142 hours,	$91.36
Labor of men,	57.00
Labor of teams,	60.50
	$208.86
Labor on new building for poultry:—	
Students' labor, 193 hours,	$15.44
Labor of men,	12.50
Labor of teams,	12.00
	$39.94
Removing rocks from cultivated lands,	70.66
Labor, repairing and building fences,	21.00
Improving highway near school buildings,	6.09
Building dam and flume at pond,	13.00
Improving land west from new school buildings,	26.40
	$385.86

BALANCE SHEET OF FARM FOR 1891.

Dr.

Live stock on hand Dec. 1, 1890, - - - -	$1,680.40
Farm implements, " " - - - - -	775.00
" products, " " - - - - -	1,042.00
Labor (student), - - - - - - -	761.91
" (not student), - - - - - - -	452.20
General supplies, - - - - - - -	329.56
Fodders purchased, - - - - - - -	262.89
Fertilizers, - - - - - - - -	57.30
Animals bought, - - - - - - -	43.00
Farm superintendent's salary, $600 ; board, $342.16,	942.16
Board of farm laborers, - - - - - -	98.70
	$6,445.12

Cr.

Live stock on hand Dec. 1, 1891, - - - -	$1,547.80
Farm tools " " - - - - -	839.00
" products " " - - - - -	1,257.55
" " furnished building department, and sold,	1,357.60
" " on hand Dec. 1, 1891, - - -	1,167.55
Use of teams for school and boarding department, -	300.00
Labor on permanent improvements, - - - -	385.86
Sale of animals, etc., - - - - - - -	38.67
	$6,894.03
	6,445.12
Balance credit, - - - - - - -	$448.91

TREASURER'S REPORT.

H. C. Miles, *Treasurer,*

In account with Storrs Agricultural School.

1890.	Dr.	
July 1.	By balance of account,	$742.93
" 7.	By cash, B. F. Koons,	100.00
Aug. 8.	" " Isaac Farwell, Jr.,	3.84
July 14.	" " Building Committee,	12.60
Oct. 2.	" " Note discounted,	1,468.50
" 6.	" " Comptroller,	2,000.00
" 10.	" " Experiment Station,	64.10
" 11.	" " L. P. Chamberlain,	33.98
1891.		
Jan. 3.	" " Comptroller,	2,000.00
" 21.	" " Experiment Station,	79.87
Feb. 5.	" " Note discounted,	1,959.00
Mch. 9.	" " Experiment Station,	2.66
April 3.	" " Comptroller,	2,000.00
" 24.	" " Note discounted,	1,321.87
May 5.	" " Experiment Station,	56.77
June 2.	" " Note discounted,	1,958.33
July 2.	" " B. F. Koons,	200.00
" 6.	" " Comptroller,	1,000.00
		$15,004.45
1891.	Cr.	
June 30.	Paid Salaries,	$3,233.99
30.	" Provisions,	1,458.08
30.	" Fuel and lights,	809.28
30.	" Boarding Department,	77.74
30.	" House furnishings,	170.90
30.	" Books and stationery,	390.71
30.	" Water rent,	10.00

June 30.	Paid Telephone rent,	$32.00
30.	" Chemicals,	30.65
30.	" Buildings,	470.02
30.	" Farm tools and repairs,	94.62
30.	" Farm supplies,	134.40
30.	" Farm stock,	26.00
30.	" Feed for farm stock,	328.40
30.	" Farm labor,	446.69
30.	" Farm fertilizers,	57.30
30.	" Blacksmith,	84.05
30.	" Furnishing new Dormitory,	1,308.52
30.	" Insurance,	527.25
30.	" Notes,	5,000.00
30.	" Sundries,	269.50
		$14,960.10
	Balance of account,	44.35
		$15,004.45

This will certify that we have examined the accounts of Henry C. Miles, Treasurer of the Storrs Agricultural School, for the fiscal year ending June 30, 1891, compared the vouchers therewith and find the same to be correct, and that there is a balance on said date in the hands of the Treasurer amounting to forty-four and $\frac{35}{100}$ dollars.

GEORGE F. LINCOLN,
D. WARD NORTHROP,
Auditors of Public Accounts.

HARTFORD, Dec. 10, 1891.

STATE OF CONNECTICUT.

ANNUAL REPORT

OF

The Connecticut Agricultural Experiment Station

For 1891

Printed by Order of the General Assembly.

NEW HAVEN:
TUTTLE, MOREHOUSE & TAYLOR, PRINTERS.
1892.

OFFICERS AND STAFF FOR 1891.

STATE BOARD OF CONTROL.

Ex-officio.

His Exc. MORGAN G. BULKELEY, *President.*

	Term expires
Appointed by Connecticut State Agricultural Society:	
Hon. E. H. HYDE, Stafford, *Vice-President.*	July 1, 1894
Appointed by Board of Trustees of Wesleyan University:	
Prof. W. N. RICE, Middletown.	1894
Appointed by Governor and Senate:	
EDWIN HOYT, New Canaan.	1892
H. L. DUDLEY, New London.	1893

Executive Committee.

Appointed by Board of Agriculture:	
T. S. GOLD, West Cornwall.	1892
Appointed by Governing Board of Sheffield Scientific School:	
W. H. BREWER, New Haven, *Secretary and Treasurer.*	1893
Ex-officio.	
S. W. JOHNSON, New Haven, *Director.*	

Chemists.

E. H. JENKINS, Ph.D., *Vice-Director.*
A. L. WINTON, Jr., Ph.B.
T. B. OSBORNE, Ph.D.
A. W. OGDEN, Ph.B.
C. G. VOORHEES, Ph.B.*

Mycologist.

ROLAND THAXTER, Ph.D.†
WILLIAM C. STURGIS, Ph.D.‡

Stenographer and Clerk.

Miss F. M. BIGELOW.

In charge of Buildings and Grounds.

CHARLES J. RICE.

Laboratory Helper.

HUGO LANGE.

* From Oct. 1st. † Till Aug. 1. ‡ From Aug. 1

ANNOUNCEMENT.

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION was established in accordance with an Act of the General Assembly approved March 21, 1877, "for the purpose of promoting Agriculture by scientific investigation and experiment."

The Station is prepared to analyze and test fertilizers, cattle-food, seeds, milk, and other agricultural materials and products, to identify grasses, weeds, useful or injurious insects, moulds, blights, mildews, etc., and to give information on various subjects of Agricultural Science, for the use and advantage of the citizens of Connecticut.

The Station makes analyses of Fertilizers, Seed-tests, etc., etc., for the citizens of Connecticut, without charge, provided—

1. That the results are of use to the public and are free to publish.
2. That the samples are taken from stock now in the market, and in accordance with the Station instructions for sampling.
3. That the samples are fully described and retail prices given on the Station "Forms for Description."

The officers of the Station will take pains to obtain for analysis samples of all the commercial fertilizers sold in Connecticut; but the organized coöperation of farmers is essential for the full and timely protection of their interests. Granges, Farmers' Clubs and like Associations can efficiently work with the Station for this purpose, by sending in duly authenticated samples early during each season of trade.

All other work proper to the Experiment Station that can be used for the public benefit will be done without charge. Work for the use of individuals will be charged for at moderate rates. The Station will undertake no work, the results of which are not at its disposal to use or publish, if deemed advisable for the public good.

Results of analysis or investigation that are of immediate general interest will be published in Bulletins, of which copies are sent to each Post Office in this State, and to every citizen of the State who applies for them. The Annual Report made to the Governor contains a *complete* account of all departments of the Station work for the preceding year.

It is the wish of the Board of Control to make the Station as widely useful as its resources will admit. Every Connecticut citizen who is concerned in agriculture, whether farmer, manufacturer, or dealer, has the right to apply to the Station for any assistance that comes within its province to render, and the Station will respond to all applications as far as lies in its power.

☞ Instructions and Forms for taking samples, and Terms for testing Fertilizers, Seeds, etc., for private parties, sent on application.

☞ Parcels by Express, to receive attention should be *prepaid*, and all communications should be directed, *not to any individual officer*, but simply to the

AGRICULTURAL EXPERIMENT STATION,
NEW HAVEN, CONN.

☞ Station Grounds, Laboratories and Office are on Suburban street, between Whitney avenue and Prospect street, 1⅝ miles north of City Hall. Suburban street may be reached by the Whitney avenue Horse Cars, which leave the corner of Chapel and Church streets three times hourly, viz: on the striking of the clock and at intervals of twenty minutes thereafter.

☞ The Station has Telephone connection and may be spoken from the Central Telephone Office, 118 Court street, or from Peck & Bishop's Office in Union R. R. Depot.

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REPORT OF THE BOARD OF CONTROL.

To His Excellency, the Governor of Connecticut:

The Board of Control herewith submits its Annual Report for the year ending November first, 1891.

In obedience to the "Act Concerning Commercial Fertilizers," the Station has collected through its special deputies, Messrs. Dennis Fenn, of Milford, and F. R. Curtis, of Stratford, as far as possible, samples of all the Commercial Fertilizers selling at ten dollars or more per ton, offered or exposed for sale in Connecticut. These collections have been made in ninety-six towns and many more villages, mostly from the stock on the spring market, and numbered a total of 643 samples, representing one hundred and forty-six distinct brands. On these and on other fertilizing materials and manures have been made 281 analyses, mostly in duplicate. These analyses have been skillfully performed under the immediate charge of Messrs. Winton and Ogden, who have spared no pains to ensure their accuracy.

As in previous years the Station has undertaken to test all the samples of butter, oleomargarine, molasses, and vinegar of which analyses have been desired by the Dairy Commissioners. This work has all been performed by Dr. Jenkins, who has also appeared in court to testify to the results whenever called upon. The number of butter and oleomargarine examinations has amounted to thirty-one.

Various feeding stuffs have been analyzed or are under investigation, either at the request of consumers or with reference to the field and feeding experiments conducted by the Station.

The determination of fat in cream by the Babcock method, and the application of this method to the work of creameries, has been the subject of considerable study, with very favorable results.

The same method has been studied with reference to its use in milk-gathering creameries, and has been already adopted for practical use in one Connecticut creamery of this class.

In response to various requests the practical working of the Babcock method has been exhibited at a number of creameries and at several dairy meetings.

Very large numbers of daily tests of the individual cows in a considerable herd whose milk was sold to consumers, were made during the winter of 1890–91, to study the variations in the daily yields, the value of the different cows for dairy purposes, and the effects of change of ration on the quality and quantity of the milk.

Two field experiments have been carried on at the farm of Mr. J. H. Webb, under Dr. Jenkins' superintendence, viz :

1. On the continuous growth of Indian corn on the same land, both under application of farm manure and of commercial fertilizers.

2. To test the relative yearly yield of potatoes from tubers of different sizes when the selection of tubers is practiced for a course of years.

Mr. J. B. Olcott has devoted much time and labor to the forage gardens, especially to that established by him, with the coöperation of this Station, on his farm at South Manchester, where he now has a most flourishing and instructive exhibit of a number of species and varieties of grasses in the purest possible culture, and on a considerable scale. Mr. Olcott has visited England and France and secured thence valuable or promising additions to his nursery of economic grasses.

Dr. Osborne has devoted himself during the year to a minute study of the albuminoids or proteids of the seeds of the oat, of flax, and of cotton, and is about to reinvestigate the albuminoids of wheat.

The Station corps of chemists has been increased by the appointment of Mr. Clark G. Voorhees, Ph.B., to assist Dr. Osborne in the work on albuminoids.

The results of the careful examination of the albuminoids of Indian corn made during 1889 and 1890 by Professor R. H. Chittenden and Dr. Osborne jointly, are in course of publication in the American Chemical Journal. It is proposed to prepare an abstract of their voluminous paper for publication in the Station report. The expense of this research, so far as materials and Dr. Osborne's time during twelve months, are concerned, was borne by this Station. To the authorities of the Sheffield Scientific School, for the use of their laboratory, and to Prof. Chittenden for his personal devotion to this important investigation, the Board of Control of this Station makes due and hearty acknowledgment.

Dr. Thaxter has severed his connection with the Station to accept a professorship in Harvard University. He will report in detail his work during 1891 with reference to quince blight, potato scab, etc.

The Board of Control takes this occasion to express its appreciation of Dr. Thaxter's distinguished service to the farmers and fruit-growers of this State.

Dr. Wm. C. Sturgis assumed the duties of mycologist to the Station in August and has been giving special attention to the organisms concerned in the fermentations or sweating of tobacco.

Mr. Winton occupied several weeks of the early autumn at Suffield with observations on the curing of tobacco by artificial heat on the "Snow Modern Barn System," and is now engaged in studies upon the composition of the tobacco leaf and the chemical changes suffered in the process of growth and curing.

A detailed account of this and other work of the Station will be given in the Report of the Director, now preparing.

Five bulletins containing seventy-nine octavo pages have been issued during the year and mailed to each newspaper, postmaster, and secretary of a farmer's organization and to all citizens of the State who applied for them.

The accompanying Report of the Treasurer exhibits the financial affairs of the Station for the fiscal year which ended June 30, 1891.

In accordance with a vote of the Board at its annual meeting in January last, preliminary measures have been taken to secure a collection of samples of the varieties of Indian corn which are under cultivation in this State. The accompanying* circular has been mailed to the officers of all the agricultural societies, farmers' clubs, and granges, and to all the newspapers of the State, and to many farmers known to give particular care to their corn crop, in order to invite the sending of samples to the Station. Some responses have already been received.

This collection is primarily intended for permanent preservation in the Station museum, but will be at the service of the proper authorities for exhibition at the Columbian Exposition at Chicago in 1893.

Respectfully submitted,

WILLIAM H. BREWER, *Secretary.*

New Haven, Conn., November, 1891.

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* Printed in Report of Director.

REPORT OF THE TREASURER.

WM. H. BREWER, *in account with the Connecticut Agricultural Experiment Station for the fiscal year ending June 30th, 1891.*

RECEIPTS.

From the State Comptroller	$8,000.00	
From the U. S. Treasurer	7,500.00	
Analysis fees due previous fiscal year, collected this year	170.00	
Analysis fees of this fiscal year	2,899.74	
Unclassified Receipts	38.22	
		$18,607.96

EXPENDITURES.

	State Acc't.	U. S. Acc't.	
Salaries	$5,130.00	$6,483.33	$11,613.33
General Laboratory expenses	1,419.78	5.98	1,425.76
Mycological expenses		220.91	220.91
Grass and Forage Investigation	807.10		807.10
Field Experiments		150.80	150.80
Gas	233.10		233.10
Water	147.00		147.00
Coal	484.50		484.50
The Establishment, Grounds, Repairs, etc.	749.36		749.36
Insurance	188.25		188.25
Telephone	100.50		100.50
Printing and Engraving	708.98	638.98	1,347.96
Stationery	119.28		119.28
Postage	94.29		94.29
Library	294.52		294.52
Collecting Fertilizers	388.30		388.30
Expenses of the Board	23.10		23.10
Unclassified Sundries	219.90		219.90
	$11,107.96	$7,500.00	$18,607.96

MEMORANDUM.

The year's accounts were audited July 31st, 1891, by the State Auditor of Public Accounts.

Analysis fees due last year but collected this, are placed to this year's account. The analysis fees of fertilizers known or believed to be on sale since May 1st, 1891, and subject to the law concerning the sale of commercial fertilizers, when collected will be credited to the new account.

WM. H. BREWER, *Treasurer.*

REPORT OF THE DIRECTOR.

The following pages contain a detailed account of the work of this Station during the past year so far as it is sufficiently advanced to justify its publication.

In the discussion of commercial fertilizers it is found necessary to reprint annually certain statements regarding the fertilizer law and the analysis and valuation of fertilizers, to answer the questions which are constantly addressed to the Station on these subjects.

THE CONNECTICUT FERTILIZER LAW.

The General Assembly at its session in 1882 passed a Fertilizer Law which went into effect September 1, 1882, and which repealed and took the place of all previous legislation on this subject. The law is still in force without any amendment.

Copies of the law may be had on application to the Station. Attention is specially called to the following requirements.

1. In case of fertilizers that retail at ten dollars or more per ton, the law holds the SELLER responsible for *affixing a correct label or statement* to every package or lot sold or offered, as well as for the *payment of an analysis fee* of ten dollars for each fertilizing ingredient which the fertilizer contains or is claimed to contain, *unless* the MANUFACTURER OR IMPORTER shall have provided labels or statements and shall have paid the fee. Sections 1 and 3.

The Station understands "the fertilizing ingredients" to be those whose determination in an analysis is necessary for a valuation, viz: Nitrogen, Phosphoric acid and Potash. The analysis-fees in case of any fertilizer will therefore be ten, twenty or thirty dollars, according as one, two or three of these ingredients are contained or claimed to exist in the fertilizer.

2. The law also requires, in case of any fertilizer selling at ten dollars or more per ton, that a *sealed sample* shall be deposited

with the Director of the Station by the MANUFACTURER OR IMPORTER, and that a *certified statement* of composition, etc., shall be filed with him.

A statement of the per cents. of Nitrogen, Phosphoric acid (P_2O_5) and Potash (K_2O), and of their several states or forms, will suffice in most cases. Other ingredients may be named if desired.

In all cases the per cent. of *nitrogen* must be stated. Ammonia may also be given when actually present in ammonia salts, and "ammonia equivalent to nitrogen" may likewise be stated.

The per cent. of soluble and reverted phosphoric acid may be given separately or together, and the term "available" may be used in addition to, but not instead of soluble and reverted.

The percentage of insoluble phosphoric acid may be stated or omitted.

In case of Bone, Fish, Tankage, Dried Meat, Dried Blood, etc., the chemical composition may take account of the two ingredients: Nitrogen, Phosphoric Acid.

For Potash Salts give always the per cent. of Potash (potassium oxide); that of Sulphate of Potash or Muriate of Potash may also be stated.

The chemical composition of other fertilizers may be given as found in the Station Reports.

3. It is also provided that EVERY PERSON in the State, who sells *any commercial fertilizer of whatever kind or price* shall annually report certain facts to the Director of the Experiment Station, and on demand of the latter shall deliver a sample for analysis. Section 4.

4. All "CHEMICALS" that are applied to land, such as: Muriate of Potash, Kainite, Sulphate of Potash and Magnesia, Sulphate of Lime (Gypsum or Land Plaster), Sulphate of Ammonia, Nitrate of Potash, Nitrate of Soda, etc.—are considered to come under the law as "Commercial Fertilizers." Dealers in these chemicals must see that packages are suitably labeled. They must also report them to the Station, and see that the analysis fees are duly paid, in order that the Director may be able to discharge his duty as prescribed in Section 9 of the Act.

It will be noticed that the State exacts no license tax either for making or dealing in fertilizers. For the safety of consumers and the benefit of honest manufacturers and dealers, the State requires that it be known what is offered for sale, and whether fertilizers are what they purport to be. With this object in view the law provides, in Section 9, that all fertilizers be analyzed and it requires the parties making or selling them to pay for these analyses in part; the State itself paying in part by maintaining the Experiment Station.

OBSERVANCE OF THE FERTILIZER LAW.

MANUFACTURERS who have paid the Analysis Fees as required by the Law, and FERTILIZERS for which fees have been thus paid for the year ending May, 1891.

Firm.	*Brand of Fertilizer.*
Acme Fertilizer Co., Maspeth, L. I.	Connecticut Potato Fertilizer.
	Acme Fertilizer No. 2.
Baker, H. J. & Bro., 215 Pearl St., N. Y.	Pelican Bone Fertilizer.
	A. A. Ammoniated Phosphate.
	Special Potato Manure.
	Special Corn Manure.
	Special Tobacco Manure.
	Pure Raw Bone, Extra Fine.
	Castor Pomace.
Bowker Fertilizer Co, 43 Chatham St., Boston, Mass.	Stockbridge Tobacco Manure.
	" Grain Manure.
	" Forage Crop Manure.
	" Vegetable Manure.
	" Fruit Manure.
	Bowker's Hill and Drill Phosphate.
	" Ammoniated Bone Fertilizer.
	" Fish and Potash.
	" Pure Dry Fish.
	" Fresh Ground Bone.
	" Kainit.
Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	Bradley's High Grade Tobacco Manure.
	" Dry Ground Fish.
	" Superphosphate.
	" Potato Manure.
	" Complete Manure for Potatoes and Vegetables.
	" for Top Dressing Grass and Grain.
	" for Corn and Grain.
	" Pure Fine Bone.
	" Circle Brand Bone and Potash.
	" Anchor Brand Fish and Potash.
	" Triangle A. Brand Fish and Potash.
	B. D. Sea Fowl Guano.
	Original Coe's Superphosphate.
	Farmers' New Method Fertilizer.
Buckingham, C., Southport, Conn.	A1 Fertilizer.
Chemical Co. of Canton, Baltimore, Md.	Special Potato Manure.
Church, Daniel T., Tiverton, R. I.	Pure Dry Ground Menhaden Guano, (A)
	Church's Special Fertilizer, (B)
	" Standard Fertilizer, (C)
	" Fish and Potash, (D)
	Acid Fish.

Firm.	*Brand of Fertilizer.*
Coe, E. Frank, 16 Burling Slip, N. Y.	Ground Bone and Potash. High Grade Phosphate. Alkaline Bone. Gold Brand Excelsior Guano. Potato Manure.
Collier White Lead & Oil Co., St Louis, Mo.	Castor Pomace.
Cooper's, Peter, Glue Factory, 17 Burling Slip, N. Y.	Pure Bone Dust.
Crocker Fertilizer & Chemical Co., Buffalo, N. Y.	Ammoniated Bone Phosphate. Potato, Hop and Tobacco Phosphate. Vegetable Bone Superphosphate. Special Potato Manure. Pure Ground Bone. Niagara Phosphate. Ammoniated Practical Superphosphate. Wheat and Corn Phosphate. New Rival Ammoniated Superphosphate. Buffalo Superphosphate, No. 2. Queen City Phosphate.
Cumberland Bone Co., Portland, Maine.	Cumberland Bone Superphosphate. Cumberland Potato Fertilizer.
Danbury Fertilizer Co., Danbury, Conn.	Ground Bone.
Darling, L. B. Fertilizer Co., Pawtucket, R. I.	Animal Fertilizer. Fine Ground Bone. Extra Bone Phosphate. Potato and Root Crop Manure.
Davidge Fertilizer Co., 121 Front St., N. Y.	Special Favorite Fertilizer.
Downes & Griffin, Birmingham, Conn.	Ground Bone.
Great Eastern Fertilizer Co., Rutland, Vt.	Great Eastern General Fertilizer for Grass and Grain. Great Eastern Vegetable, Vine and Tobacco Fertilizer. Great Eastern General Phosphate for Oats, Buckwheat and Seeding Down.
Hewitt, A. F., Groton, Conn.	Oak Lawn Ground Bone.
Hull, H. C., Meriden, Conn.	Ground Bone.
Kelsey, E. R., Branford, Conn.	Bone, Fish and Potash.
Lister's Agricultural Chemical Works, Newark, N. J.	Ammoniated Dissolved Bone. Potato Fertilizer. Standard Superphosphate of Lime. Celebrated Ground Bone.
Luce Bros., Niantic, Conn.	Ground Acidulated Fish Guano.

Firm.	*Brand of Fertilizer.*
Mapes Formula & Peruvian Guano Co., 143 Liberty St., N. Y.	Potato Manure.
	Complete Manure for Light Soils.
	Complete Manure for General Use.
	Tobacco Manure, Connecticut Brand.
	Fruit and Vine Manure.
	Peruvian Guano.
	Corn Manure.
	Complete Manure, "A" Brand.
	Fine Dissolved Bone.
	Tobacco Manure, Wrapper Brand.
	Seeding Down Manure.
	Grass and Grain Spring Top Dressing.
Miles Fertilizer & Oil Co., The, Milford, Conn.	IXL. Ammoniated Bone Superphosphate.
Miller, G. W., Middlefield, Conn.	Pure Ground Bone.
	Flour of Bone Phosphate.
National Fertilizer Co., Bridgeport, Ct.	Chittenden's Complete Fertilizer.
	" Ammoniated Bone Phosphate.
	" Fish and Potash.
	" Ground Bone.
Nuhn, Frederick, Waterbury, Conn.	Self Recommending Fertilizer.
Olds & Whipple, Hartford, Conn.	Castor Pomace.
Peck Bros., Northfield, Conn.	Ground Bone.
Plumb & Winton, Bridgeport, Conn.	Bone Fertilizer.
Quinnipiac Co., The, 7 Exchange Place, Boston, Mass.	Quinnipiac Phosphate.
	" Potato Manure.
	" Phosphate, (Pine Island Brand).
	" Market Garden Manure.
	" Fish and Potash, (Crossed Fishes Brand).
	" Fish & Potash (Plain Brand).
	" Dry Ground Fish.
	" Bone Meal.
	Sulphate of Potash.
	Muriate of Potash.
	Blood Bone and Meat Tankage.
	Nitrate of Soda.
Read Fertilizer Co., Box 3121, N. Y.	Standard Fertilizer.
	High Grade Farmers' Friend.
	Fish and Potash.
	Samson Brand Fertilizer.
Reese, J. S. & Co., 10 South St., Baltimore, Md.	New England Favorite.
	Mayflower Fertilizer.
	Pilgrim Fertilizer.
	Special Potato Fertilizer.
Rogers Mfg. Co., The, Rockfall, Conn.	Ground Bone.

Firm.	*Brand of Fertilizer.*
Rogers & Hubbard Co., Middletown, Ct.	Pure Raw Knuckle Bone Flour.
	Pure Ground AX Bone.
	Soluble Potato Manure.
	Fairchild's Seeding Down Formula.
	" Corn Formula.
Sanderson, L., New Haven, Conn.	Formula A, Mixed.
	Fine Ground Bone.
	Pulverized Bone and Meat.
	Blood, Bone and Meat.
	Nitrate of Soda.
	Sulphate of Ammonia.
	Muriate of Potash.
	Sulphate of Potash.
	Fine Ground Fish.
	Dissolved Bone Black.
Shoemaker, M. L. & Co., Philadelphia, Pa.	Swift Sure Superphosphate.
	Swift Sure Bone Meal.
Stewart, W. D. & Co., Boston, Mass.	Soluble Pacific Guano.
	Special Potato Manure.
Wilcox, Leander, Mystic, Conn.	Ammoniated Bone Phosphate.
	Potato Manure.
	High Grade Fish and Potash.
	Dry Ground Fish Guano.
Williams & Clark Fertilizer Co., 81 Fulton St., N. Y.	Americus Superphosphate.
	" Potato Manure.
	" High Grade Special.
	" Bone Meal.
	Royal Bone Phosphate.
Wilkinson & Co., 52 Williams St., N. Y.	Economical Bone Fertilzer.

ANALYSES OF FERTILIZERS.

During the past year 281 analyses of fertilizers and manurial waste products have been made at this Station. A classified list of them is given on page 26.

Of these a small number were examined for private parties and for other Experiment Stations to compare and test methods of analysis.

The Station has been fortunate in again securing the skillful services of Mr. Dennis Fenn of Milford and Mr. F. R. Curtiss of Stratford as its Agents to collect samples of fertilizers from all parts of the State.

These gentlemen during April and May visited ninety-six towns and a considerably larger number of villages, distributed as follows:

Hartford Co.	19
Tolland Co.	6
Windham Co.	11
New London Co.	10
Middlesex Co.	10
New Haven Co.	18
Fairfield Co.	16
Litchfield Co.	6
	96

Six hundred and forty-three samples were drawn representing one hundred and forty-six different brands.

In this way one or more samples were secured of nearly every brand of fertilizer which is offered for sale within the State. When several samples of a single brand were drawn in different parts of the State the analysis was performed, not on any single sample, but on a mixture made of an equal weight of each of the several samples. Thus, it is believed, the average composition of the goods is more fairly represented than by the analysis of any single sample.

The Station agents are instructed in every case to open at least three packages of each brand for sampling, and if the number of packages is large, to take a portion from every tenth one, by means of a sampling tube which withdraws a section or core through the entire length of the bag or barrel.

As a rule, the Station will not analyze samples—

1. From dealer's stock of less than one ton.
2. From stock which has lain over from last season.
3. From stock which evidently is improperly stored, as in bags lying on wet ground or exposed to the weather, etc.

The Station desires the coöperation of farmers, farmers' clubs, and granges in calling attention to new brands of fertilizers, and in securing samples of all goods offered for sale. All samples drawn by other than Station agents *must* be drawn in accordance with the Station's Instructions for sampling, and properly certified, if the Station analysis is desired. A copy of these instructions and blank certificates will be sent on application.

Samples are analyzed as promptly as possible in the order in which they are received. As soon as an analysis is completed a copy of it is sent to the party who furnished the sample, and also to the manufacturer, in order that there may be opportunity for explanation or protest, if desirable, before the results are published in the Bulletin.

The following "Explanations" are intended to embody the principles and data upon which the valuation of fertilizers is based, a knowledge of which is essential to a correct understanding of the analyses that are given on subsequent pages.

EXPLANATIONS CONCERNING THE ANALYSIS OF FERTILIZERS AND THE VALUATION OF THEIR ACTIVE INGREDIENTS.

REVISED.

NITROGEN is the most rare, and commercially the most valuable fertilizing element.

Free Nitrogen is indeed universally abundant in the common air, but in this form its effects in nourishing vegetation are as yet obscure.

Organic Nitrogen is the nitrogen of animal and vegetable matters, which is chemically united to carbon, hydrogen and oxygen. Some forms of organic nitrogen, as those of blood, flesh and seeds, are highly active as fertilizers ; others, as found in leather and peat, are comparatively slow in their effect on vegetation, unless these matters are chemically disintegrated.

Ammonia (NH_3) *and nitric acid* (N_2O_5) are results of the decay of *organic nitrogen* in the soil and manure heap, and contain Nitrogen in its most active forms. They occur in commerce—the former in sulphate of ammonia, the latter in nitrate of soda. 17 parts of ammonia or 66 parts of pure sulphate of ammonia contain 14 parts of nitrogen. 85 parts of pure nitrate of soda also contain 14 parts of nitrogen.

PHOSPHORUS is, next to nitrogen, the most costly ingredient of Fertilizers, in which it always exists in the form of phosphates, usually those of calcium, iron and aluminum, or in case of some "superphosphates," in the form of free phosphoric acid.

Soluble Phosphoric acid implies phosphoric acid or phosphates that are freely soluble in water. It is the characteristic ingredient of Superphosphates, in which it is produced, by acting on "insoluble" or "reverted" phosphates, with diluted sulphuric acid (oil of vitriol). Once well incorporated with the soil, it gradually becomes reverted phosphoric acid.

Reverted (*reduced or precipitated*) *Phosphoric acid* means strictly, phosphoric acid that was once easily soluble in water, but from chemical change has become insoluble in that liquid. In present usage the term signifies the phosphoric acid (of various phosphates) that is freely taken up by a strong solution of ammonium citrate, which is therefore used in analysis to determine its quantity. "Reverted phosphoric acid" implies phosphates that are readily assimilated by crops.

Recent investigation tends to show that soluble and reverted phosphoric acid are on the whole about equally valuable as plant food, and of nearly equal commercial value. In some cases, indeed, the soluble gives better results on crops, in others the reverted is superior. In most instances there is probably little to choose between them.

Insoluble Phosphoric acid implies various phosphates not soluble in water or ammonium citrate. In some cases the phosphoric acid is too insoluble to be readily available as plant-food. This is especially true of the crystallized green Canada Apatite. Bone-black, bone-ash, South

Carolina Rock and Navassa Phosphate when in coarse powder are commonly of little repute as fertilizers though good results are occasionally reported from their use. When *very finely pulverized* ("floats") they more often act well, especially in connection with abundance of decaying vegetable matters. The phosphate of calcium in raw bones is nearly insoluble, because of the animal matter of the bones, which envelops it; but when the latter decays in the soil, the phosphate remains in essentially the "reverted" form. The phosphoric acid of "Thomas-Slag" and of "Grand Cayman's Phosphate" is freely taken up by crops.

Phosphoric acid in all the Station analyses is reckoned as "anhydrous phosphoric acid" (P_2O_5) also termed among chemists, phosphoric anhydride, phosphoric oxide, and phosphorus pentoxide.

POTASSIUM is the constituent of Fertilizers, which ranks third in costliness. In plants, soils and fertilizers, it exists in the form of various salts, such as chloride (muriate), sulphate, carbonate, nitrate, silicate, etc. Potassium itself is scarcely known except as a chemical curiosity.

Potash signifies the substance known in chemistry as potassium oxide (K_2O), which is reckoned as the valuable fertilizing ingredient of "potashes" and "potash salts." In these it should be freely soluble in water and is most costly in the form of sulphate, and cheapest in the form of muriate (potassium chloride).

The Valuation of a Fertilizer, as practised at this station, consists in calculating the *retail Trade-value* or *cash-cost* (in raw material of good quality) of an amount of nitrogen, phosphoric acid and potash equal to that contained in one ton of the fertilizer.

Plaster, lime, stable manure and nearly all of the less expensive fertilizers have variable prices, which bear no close relation to their chemical composition, but guanos, superphosphates and similar articles, for which $30 to $50 per ton are paid, depend chiefly for their trade-value on the three substances, *nitrogen*, *phosphoric acid* and *potash*, which are comparatively costly and steady in price. The trade-value per pound of these ingredients is reckoned from the current market prices of the standard articles which furnish them to commerce.

The consumer, in estimating the reasonable price to pay for high-grade fertilizers, should add to the *Trade-value of the above named Ingredients*, a suitable margin for the expenses of manufacture, etc., and for the convenience or other advantage incidental to their use.

The average Trade-values or retail cost in market, per pound, of the ordinarily occurring forms of nitrogen, phosphoric acid and potash, as found in New England, New York and New Jersey markets, are as follows:

THE TRADE-VALUES FOR 1891 OF FERTILIZING INGREDIENTS IN RAW MATERIALS AND CHEMICALS.

The average Trade-Values or *retail cost per pound* of the ordinarily occurring forms of nitrogen, phosphoric acid and potash are as follows:

	Cts. per lb.
Nitrogen in ammonia salts	18½
nitrates	14½
Organic nitrogen in dry and fine ground fish, meat and blood	15½
in cotton seed meal and castor pomace	15
in fine bone and tankage	15
in fine medium bone and tankage	12
in medium bone and tankage	9½
in coarser bone and tankage	7½
in hair, horn shavings and coarse fish scrap	7
Phosphoric acid, soluble in water	8
in ammonium citrate*	7½
in dry ground fish, fine bone and tankage	7
in fine medium bone and tankage	5½
in medium bone and tankage	4½
in coarser bone and tankage	3
Potash as high-grade Sulphate and in forms free from Muriate (or Chlorides)	5½
as muriate	4½

These Trade-values were agreed upon by the Experiment Stations of Massachusetts, New Jersey, and Connecticut, for use in their respective States during 1891. They are the average prices at which, during the six months preceding March last, the respective ingredients were retailed for cash, in our large markets, in those raw materials which are the regular source of supply. They also correspond to the average wholesale price for the six months ending March 1st, plus about 20 per cent. in case of goods for which we have wholesale quotations. The valuations obtained by use of the above figures will be found to correspond fairly with the *average retail prices* at the large markets of standard raw materials, such as :

Sulphate of Ammonia,
Nitrate of Soda,
Dried blood,
Azotin,
Ammonite,
Muriate of Potash,
Sulphate of Potash,
Plain Superphosphate,
Dry Ground Fish,
Bone and Tankage,
Ground South Carolina Rock.

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*Dissolved from 2 grams of the unground phosphate previously extracted with pure water, by 100 c. c. neutral solution of Ammonium Citrate, sp. gr. 1.09, in 30 minutes, at 65° C., with agitation once in five minutes. Commonly called "reverted" or "backgone" Phosphoric Acid.

VALUATION OF SUPERPHOSPHATES, SPECIAL MANURES AND MIXED FERTILIZERS OF HIGH GRADE.

The organic nitrogen in these classes of goods is reckoned at the price of nitrogen in raw materials of the best quality.

Insoluble Phosphoric Acid is reckoned at 2 cents per pound. Potash is rated at 4½ cents, if sufficient chlorine is present in the fertilizer to combine with it to make muriate. If there is more Potash present than will combine with the chlorine, then this excess of Potash is reckoned at 5½ cents per pound.

In most cases the valuation of the Ingredients in Superphosphates and Specials falls below the retail price of these goods. The difference between the two figures represents the manufacturer's charges for converting raw materials into manufactured articles and selling them. These charges are for grinding and mixing, bagging or barreling, storage and transportation, commission to agents and dealers, long credits, interest on investments, bad debts, and finally, profits.

The majority of the manufacturers agree that the average cost of mixing, bagging, handling and cartage ranges from $3.00 to $4.50 per ton.

In 1891 the average selling price of Ammoniated Superphosphates, and Guanos was $33.93 per ton, the average valuation was $28.13, and the difference $5.80, an advance of 20.6 per cent. on the valuation and on the wholesale cost of the fertilizing elements in the raw materials.

In case of Special Manures the average cost was $38.84, the average valuation $31.64, and the difference $7.20, or 22.8 per cent. advance on the valuation.

To obtain the Valuation of a Fertilizer we multiply the pounds per ton of Nitrogen, etc., by the trade-value per pound. We thus get the values per ton of the several ingredients, and adding them together we obtain the total valuation per ton.

In case of *Ground Bone*, the sample is sifted into four grades and we separately compute the nitrogen-value of each grade by multiplying the pounds of nitrogen per ton, by the per cent. of each grade, taking $\frac{1}{100}$th of that product, multiplying it by the trade-value per pound of nitrogen in that grade, and taking this final product as the result in cents. Summing up the separate values of each grade thus obtained, together with the values of each grade of phosphoric acid, similarly computed, the total is the Valuation of the sample of bone.

The uses of the " Valuation" are two-fold :

1. To show whether a given lot or brand of fertilizers is worth, as a commodity of trade, what it costs. If the selling price is not higher than the valuation, the purchaser may be tolerably sure that the price is reasonable. If the selling price is twenty to twenty-five per cent. higher than the valuation, it may still be a fair price ; but in proportion as the cost per ton exceeds the valuation there is reason to doubt the economy of its purchase.

2. Comparisons of the valuation and selling prices of a number of similar fertilizers will generally indicate fairly which is the best for the money.

But the valuation is not to be too literally construed, for analysis cannot decide accurately what is the *form* of nitrogen, etc., while the mechanical condition of a fertilizer is an item whose influence cannot always be rightly expressed or appreciated.

For the above first-named purpose of valuation, the trade-values of the fertilizing elements which are employed in the computations should be as exact as possible, and should be frequently corrected to follow the changes of the market.

For the second-named use of valuation frequent changes of the trade-value are disadvantageous, because two fertilizers cannot be compared as to their relative money-worth, when their valuations are deduced from different data.

Experience leads to the conclusion that the trade-values adopted at the beginning of a year should be adhered to as nearly as possibly throughout the year, notice being taken of considerable changes in the market, in order that due allowance may be made therefor.

The *Agricultural value* of a fertilizer is measured by the benefit received from its use, and depends upon its fertilizing effect, or crop-producing power. As a broad, general rule, it is true that Peruvian guano, superphosphates, fish-scraps, dried blood, potash salts, etc., have a high agricultural value which is related to their trade-value, and to a degree determines the latter value. But the rule has many exceptions, and in particular instances the trade-value cannot always be expected to fix or even to indicate the agricultural value. Fertilizing effect depends largely upon soil, crop and weather, and as these vary from place to place, and from year to year, it cannot be foretold or estimated except by the results of past experience, and then only in a general and probable manner.

CLASSIFICATION OF FERTILIZERS ANALYZED.

The fertilizers and manurial waste products analyzed at the Station laboratory from November 1st, 1890, to November 1st, 1891, were as follows :

RAW MATERIALS COMMONLY USED IN MIXED FERTILIZERS.

1. *Containing Nitrogen as the Chief Valuable Ingredient.*

Nitrate of Potash	1
Nitrate of Soda	3
Sulphate of Ammonia	4
Cotton Seed Meal	5
Castor Pomace	6

2. *Containing Phosphoric Acid as the Chief Valuable Ingredient.*

"Odorless Phosphate"	1
Double Superphosphate	1
Dissolved Bone Black	3

3. *Containing Potash as the Chief Valuable Ingredient.*

High Grade Sulphate	1
Double Sulphate of Potash and Magnesia	3
Muriate of Potash	3
Krugit	1

4. *Containing Nitrogen and Phosphoric Acid.*

Bone Manures	33
Tankage	11
Fish	5
Bat Guano	1

MIXED FERTILIZERS.

Bone and Potash	5
Nitrogenous Superphosphates and Guanos	73
Special Manures	43
Home-mixed Fertilizers	19

MISCELLANEOUS FERTILIZERS AND MANURES.

Cotton Hull Ashes	34
Unleached Wood Ashes, Canada	12
" " " Connecticut	2
Lime-kiln Ashes	1
Ashes from Brass Works	3
Rag Dust	1
Yard Manure	3
Hen Manure	1
Beef Scraps	1
Muck	1
Total	281

These analyses are discussed in the order above given. In all cases where the contrary is not stated the samples were drawn by agents of the Station from stock in dealers' hands. The regular retail prices are given wherever possible. In many cases the actual cash prices paid by puchasers have been less than those here stated.

I. RAW MATERIALS OF HIGH-GRADE CONTAINING NITROGEN AS THE CHIEF VALUABLE INGREDIENT.

NITRATE OF SODA.

Nitrate of Soda is mined in Chili and purified there before shipment. It usually contains about 16 per cent. of nitrogen, equivalent to 97 per cent. of pure nitrate of soda. It contains besides a little salt and some moisture. The usual guarantee is "96 per cent." of nitrate of soda equivalent to 15.8 per cent. of nitrogen.

3126. Sold by L. Sanderson, New Haven. Sampled by E. F. Thompson, Warehouse Point.

3140. Sold by L. Sanderson, New Haven. Sampled by Station agent.

3214. From Quinnipiac Co., New London. Sold by Olds & Whipple, Hartford. Sampled by Station agent.

ANALYSES.

	3126	3140	3214
Water	2.32	2.40	1.46
Salt	.51	.66	.32
Sulphate of Soda	.41	.59	.12
Matters insoluble in water	.14	.19	.35
*Pure Nitrate of Soda	96.62	96.16	97.75
	100.00	100.00	100.00
*Containing Nitrogen	15.94	15.87	16.13
Cost per ton	$50.00	$50.00	$50.00
Nitrogen costs per pound in cents	**15.7**	**15.7**	**15.5**

SULPHATE OF AMMONIA.

This article, now made on a large scale as a by-product of gas-works, usually contains over 20 per cent. of nitrogen, the equivalent of from 94 to 97 per cent. of sulphate of ammonia. The rest is chiefly moisture. The usual guarantee is 25 per cent. of ammonia, which is equivalent to 20.6 per cent. of nitrogen, but commercial sulphate of ammonia commonly contains less than that quantity.

3131. Sold by L. Sanderson, New Haven. Sampled by E. F. Thompson, Warehouse Point.

3137. Sold by L. Sanderson, New Haven. Sampled by Station agent.

3185. From Quinnipiac Co. Sold by Olds & Whipple, Hartford. Sampled by E. F. Thompson, Warehouse Point.

3215. From Quinnipiac Co. Sold by Olds & Whipple, Hartford. Sampled by Station agent.

ANALYSES.

	3131	3137	3185	3215
Nitrogen	20.53	20.70	20.62	20.80
Equivalent ammonia	24.92	25.13	25.03	25.25
Cost per ton	$72.00	$72.00	$72.00	$72.00
Nitrogen costs per pound in cents	17.5	17.4	17.4	17.3

COTTON SEED MEAL.

The seed of the cotton plant, after ginning to remove the fiber, passes through a mill which hulls or decorticates it. The hulled seed is ground and the oil expressed. The ground cake from the presses is used as a cattle food and fertilizer. The hulls are burned for fuel in the oil factory and the ashes, which contain from 20 to 30 per cent. of potash, are also used as a fertilizer.

Sometimes, however, hulls and seed are ground together, making "undecorticated meal" which contains considerably less nitrogen and has correspondingly less money value as a fertilizer or as a feed. When the meal has undergone heating or fermentation, its color changes from a deep yellow to brown or reddish-brown. It is then unfit for cattle food and is sold at a cheaper rate as a fertilizer.

3163 and **3209.** Sold by Olds & Whipple, Hartford. Sampled by Eugene Brown, Poquonock. These samples were of a dark brown color and not thoroughly "decorticated" or freed from hulls, which explains the lower values.

3164. "No. 1 Fort Smith." Sold by Olds & Whipple, Hartford. Sampled by Eugene Brown, Poquonock.

3167. Sold by I. L. Spencer, Suffield. Sampled by Wm. G. Viets, Thompsonville.

ANALYSES.

	3163	3209	3164	3167
Nitrogen	4.36	4.23	7.56	6.64
Phosphoric acid	1.79	1.83	3.26	2.98
Potash	1.53	1.49	2.00	1.86
Cost per ton	$24.50	$24.50	$27.00	$26.50
Nitrogen costs per pound in cents*	23.3	24.0	13.4	15.3

* Allowing 7c. and 5½c. per pound respectively for phosphoric acid and potash.

The two samples of undecorticated meal though costing $2.50 less per ton than the decorticated were very much less economical to purchase. In them nitrogen cost about ten cents more per pound than in the decorticated meal.

CASTOR POMACE.

The ground residue of castor beans from which castor oil has been extracted.

3115. Sold for L. Sanderson, New Haven, by J. C. Eddy, Simsbury. Sampled by C. P. Case.

3150. From Bowker Fertilizer Co., Boston. Sold by A. D. Bridge. Sampled by Thomas J. Stroud, Shaker Station.

3208. Sold by Eli T. Hough, agent, Poquonock. Sampled by A. E. Holcomb, Poquonock.

3218. From H. J. Baker & Co., New York. Sold by W. F. Andross, East Hartford. Sampled by Station agent.

3346. Made by Red Seal Castor Oil Co., St. Louis. Sold by Olds & Whipple, Hartford. Sampled by Station agent.

3352. Made by Collier Castor Oil Co., St. Louis. Sold by F. Ellsworth, Hartford. Sampled by Station agent.

ANALYSES.

	3115	3150	3208	3218	3346	3352
Nitrogen	5.77	4.77	5.26	4.89	5.40	5.37
Phosphoric acid	1.85	2.13	1.69	1.73	1.80	1.54
Potash	1.08	1.07	1.06	1.09	1.00	.88
Cost per ton	$20.00		$19.50	$18.50	$20.00	$20.00
Nitrogen costs per pound in cents*	13.9		15.2	15.2	15.2	15.7

* Allowing 7c. and 5½c. respectively for phosphoric acid and potash.

II. RAW MATERIALS OF HIGH GRADE CONTAINING PHOSPHORIC ACID.

"ODORLESS PHOSPHATE."

3190. A sample of this material was drawn from stock purchased of Jacob Reese of Phila., by J. H. Ives of Danbury.

ANALYSIS.

Soluble phosphoric acid	None.
"Reverted" phosphoric acid	6.36
Insoluble phosphoric acid	17.01
Total phosphoric acid	23.37
Cost per ton	$25.00

This is Basic Slag from steel works. It will hardly come into use as a fertilizer at the price quoted above.

If Basic Slag could be purchased cheaply enough, it would be well worth the attention of those tobacco growers who endeavor to avoid the use of any but a small quantity of sulphates on their land.

DOUBLE SUPERPHOSPHATE.

3406. This material is made by the American Phosphate and Chemical Co. of Baltimore, Md., and the manufacturers state will be introduced into Connecticut the coming season.

The sample sent by the manufacturers as fairly representing the goods is a fine, dry grayish material having the following composition :

	Per cent.
Phosphoric acid, soluble	35.22
Phosphoric acid, reverted	5.91
Phosphoric acid, insoluble	.74
Lime	17.78
Sulphuric acid	5.44
Moisture at 100° C.	5.07
Sand and other insoluble matters	6.37
Combined water and matters undetermined	23.47
	100.00

It will be seen that this material contains nearly two and a half times as much phosphoric acid as dissolved bone black and has comparatively little sulphuric acid. If it can be bought at reasonable rates this double superphosphate will be very acceptable to those tobacco growers who desire a quickly available phosphate but object to the presence of much free sulphuric acid or soluble sulphates in their fertilizers.

DISSOLVED BONE BLACK.

A superphosphate made by treating waste and spent bone black from the sugar refineries with oil of vitriol which renders nearly all of the phosphoric acid soluble in water.

3132. Sold by L. Sanderson, New Haven. Sampled by E. F. Thompson, Warehouse Point.

3133. Sold by L. Sanderson, New Haven. Sampled by Station agent.

3184. Sold by Olds & Whipple, Hartford. Sampled by E. F. Thompson, Warehouse Point.

ANALYSES.

	3132	3133	3184
Soluble phosphoric acid	15.58	16.24	16.40
Reverted phosphoric acid	.06	.10	.23
Insoluble phosphoric acid	.06	.09	none.
Cost per ton	$26.00	$26.00	$26.00
Soluble phosphoric acid costs per pound in cents	8.3	7.95	7.92

III. RAW MATERIALS OF HIGH GRADE CONTAINING POTASH.

DOUBLE SULPHATE OF POTASH AND MAGNESIA.

This material is usually sold as "sulphate of potash" or "manure salts," on a guarantee of "48–50 per cent. sulphate," which is equivalent to 25.9–27 per cent. of actual potash. Besides some 46–50 per cent. of sulphate of potash it contains over 30 per cent. of sulphate of magnesia, chlorine equivalent to 3 per cent. of common salt, a little sulphate of soda and lime, with varying quantities of moisture.

3128. Sold by L. Sanderson, New Haven. Sampled by E. F. Thompson, Warehouse Point.

3141. Sold by L. Sanderson, New Haven. Sampled by Station agent.

3187. Sold by Olds & Whipple, Hartford. Sampled by E. F. Thompson, Warehouse Point.

ANALYSES.

	3128	3141	3187
Potash	26.61	25.22	25.46
Equivalent sulphate of potash	49.2	46.7	47.1
Cost per ton	$30.00	$30.00	$30.00
Potash costs per pound in cents	**5.6**	**5.9**	**5.9**

MURIATE OF POTASH.

Commercial muriate of potash contains about 80 per cent. of muriate of potash (potassium chloride), 15 per cent. or more of common salt (sodium chloride), and 4 per cent. or more of water.

It is generally retailed on a guarantee of 80 per cent. muriate, which is equivalent to 50.5 per cent. of actual potash.

3127. Sold by L. Sanderson, New Haven. Sampled by E. F. Thompson, Warehouse Point.

3134. Sold by L. Sanderson, New Haven. Sampled by Station agent.

3217. From Quinnipiac Co., New London. Sold by Olds & Whipple, Hartford. Sampled by Station agent.

ANALYSES.

	3127	3134	3217
Potash	49.60	50.62	52.68
Cost per ton		$42.50	$43.00
Potash costs per pound in cents		**4.2**	**4.1**

IV. RAW MATERIALS CONTAINING NITROGEN AND PHOSPHORIC ACID.

BONE MANURES.

The terms "Bone Dust," "Ground Bone," "Bone Meal" and "Bone" applied to fertilizers, sometimes signify material made from dry, clean and pure bones; in other cases these terms refer to the result of crushing fresh or moist bones which have been thrown out either raw or after cooking, with more or less meat, tendon, and grease—and if taken from garbage heaps, with ashes or soil adhering; again they denote mixtures of bone, blood, meat and other slaughter-house refuse which have been cooked in steam-tanks in order to recover grease, and are then dried and sometimes sold as "tankage;" or, finally, they apply to bone from which a large share of the nitrogen has been extracted in the glue manufacture. The nitrogen of all these varieties of bone when they are in the same state of mechanical subdivision has essentially the same fertilizing value.

1. *Sampled by Station Agents.*

On pages 34 to 36 are tabulated 20 analyses.

The last of these, No. **3199**, Lister's Ground Bone, is a mixture of bone with salt-cake.

The average cost of the other 19 samples is $33.66 and the average valuation $35.58, showing a more satisfactory agreement between cost and valuation than in former years.

Samples **3176** Ground Raw Knuckle Bone, and **3177** Pure Ground A X Bone, both made by the Rogers and Hubbard Co., Middletown, and sampled by Station agent from stocks of the City Coal and Wood Co. of New Britain, and A. E. Kilburn of East Hartford, were analyzed with the results given below.

They are not included in the tables for the reason that the manufacturers objected that the mechanical condition was very different from that which their goods had generally shown, and as the same sieves were used in screening as formerly, they felt sure that some error had been made.

Further samples of the same brands were accordingly drawn and analyzed.

ANALYSES.

Mechanical Analyses.

	3176	**3177**
Fine, smaller than $\frac{1}{50}$ inch	58	30
Fine medium, smaller than $\frac{1}{25}$ inch	42	30
Medium, smaller than $\frac{1}{12}$ inch	--	25
Coarse, larger than $\frac{1}{12}$ inch	--	15
	100	100

Chemical Analyses.

Nitrogen	4.06	4.55
Phosphoric acid	25.20	20.89
Valuation per ton	$43.26	$32.84

Bone Manures Sampled by the Station.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3196	Pure Bone Dust.	Peter Cooper's Glue Factory, N. Y.	Wilson & Burr, Middletown.	$28.00
3198	Fine Ground Bone.	L. B. Darling Fertilizer Co., Pawtucket, R. I.	City Coal & Wood Co., New Britain.	34.00
			W. W. Cooper, Suffield.	38.00
3138	Fine Ground Bone.		L. Sanderson, New Haven.	32.00
3220	Pure Fine Ground Bone.	Bradley Fertilizer Co., 27 Kilby St., Boston.	Strong & Tanner, Winsted.	34.00
			Waterbury & June, Greenwich.	34.00
			R. A. Parker, Warehouse Point.	36.00
			J. A. Lewis, Willimantic.	32.00
			J. E. Holmes, Stratford.	32.00
			W. H. Cheney's Sons, So. Manchester.	38.00
			City Coal & Wood Co., New Britain.	33.00
			Carter & Strong, Manchester.	36.00
3348	Raw Knuckle Bone Flour.	Rogers & Hubbard Co., Middletown.	Manufacturer.	40.00
3182	Ground Bone.	Plumb & Winton, Bridgeport.	Manufacturer.	30.00
3179	Swift Sure Bone Meal.	M. L. Shoemaker & Co., Philadelphia.	J. P. Barstow & Co., Norwich.	38.00
			F. Ellsworth, Hartford.	40.00
3200	Chittenden's Ground Bone.	National Fertilizer Co., Bridgeport.	E. W. Wilson, Ellington.	----
			L. W. Currier, Bridgeport.	35.00
3319	Fine Ground Bone.	Quinnipiac Co., New London.	G. M. Williams, New London.	35.00
			John Greenwood, Norwalk.	34.00
			Olds & Whipple, Hartford.	35.00

Bone Manures Sampled by the Station.—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3180	Pure Ground Bone.	E. Frank Coe, 16 Burling Slip, N. Y.	I. W. Denison, Mystic.	$35.00
			Wheeler & Howe, Bridgeport.	30.00
			J. P. Barstow & Co., Norwich.	32.00
3181	Pure Ground Bone.	Peck Bros., Northfield.	Strong & Tanner, Winsted.	32.00
			Manufacturer.	28.00
3192	Bone Meal.	Danbury Fertilizer Co., Danbury.	Manufacturer.	32.50
3349	Pure Ground A. X. Bone.	Rogers & Hubbard, Middletown.	Manufacturer.	32.00
3222	Pure Bone Meal.	Williams & Clark Co., 83 Fulton St., N. Y.	D. B. Wilson, Waterbury.	35.00
			Chas. Kingsbury, So. Coventry.	36.00
3194	Ground Bone.	Mapes Formula & Peruvian Guano Co., N. Y.	A. N. Clark, Milford.	34.00
3178	Pure Ground Bone.	Downs & Griffin, Ansonia.	Abbott & Co., Birmingham.	38.00
3195	Fine Ground Bone.	Bowker Fertilizer Co., Boston, Mass.	T. Hallock & Co., Birmingham.	33.00
3347	G. W. Miller's Pure Ground Bone.	G. W. Miller, Middlefield.	Manufacturer.	30.00
3197	Pure Ground Bone.	Crocker Fertilizer Co., Buffalo, N. Y.	F. N. Barton, Watertown.	36.00
			H. C. Aborn, Ellington.	36.00
3199	Lister's Ground Bone.	Lister's Agricultural Chemical Works, Newark, N. J.	J. P. Barstow & Co., Norwich.	30.00

ANALYSES OF BONE MANURES.—SAMPLED BY THE STATION.

Station No.	Name or Brand.	Chemical Analysis.		Mechanical Analysis.				Cost per ton.	Valuation per ton.	Percentage difference between cost and valuation.
		Nitrogen.	Phos. Acid.	Finer than			Coarser than			
				1/50 inch.	1/25 inch.	1/12 inch.	1/12 inch.			
										Valuation exceeds cost.
3196	Peter Cooper's Pure Bone Dust	1.64	30.92	42	18	19	21	$28.00	$37.41	25.2
3198	Darling's Fine Bone	2.44	27.31	64	25	10	1	36.00	41.28	12.8
3138	Sanderson's Fine Ground Bone	3.68	24.41	37	22	41	0	32.00	36.47	12.3
3220	Bradley's Pure Ground Bone	3.25	22.50	68	27	5	--	34.00	38.21	11.0
3348	Rogers & Hubbard Co's. Raw Knuckle Bone Flour	3.92	25.39	65	35	--	--	40.00	43.84	8.7
3182	Plumb & Winton's Ground Bone	3.99	21.20	40	21	21	18	30.00	32.58	7.9
3179	Shoemaker's Swift Sure Bone Meal	6.02	21.04	60	32	8	--	40.00	42.97	6.9
3200	National Fertilizer Co's. Ground Bone	3.54	23.18	44	26	18	12	33.00	35.06	5.9
3193	Quinnipiac Co's. Fine Ground Bone	2.88	22.84	66	22	9	3	35.00	37.02	5.4
3180	E. F. Coe's Ground Bone	2.66	22.13†	52	23	13	12	32.00	33.54	4.6
3181	Peck Bro's. Pure Ground Bone	4.32	20.85	13	30	37	20	28.00	29.33	4.5
3192	Danbury Fertilizer Co's. Bone Meal	3.99	22.40	32	28	30	10	32.50	33.70	3.5
3349	Rogers & Hubbard Co's. Pure Ground AX Bone	4.06	22.26	32	23	32	13	32.00	33.17	3.5
3222	Williams, Clark & Co's. Pure Bone Meal	2.52	21.97	72	22	6	--	35.00	35.71	1.9
3194	Mapes' Ground Bone	3.85	25.91	11	36	47	6	34.00	34.56	1,6
										Cost exceeds valuation.
3178	Downs & Griffin's Pure Ground Bone	4.34	21.66	53	22	17	8	38.00	36.81	3.2
3195	Bowker's Fine Ground Bone	4.07	25.46	2	14	84	--	33.00	31.98	3.2
3347	G. W. Miller's Pure Ground Bone	3.79	22.61	21	20	22	37	30.00	29.02	3.4
3197	Crocker's Pure Ground Bone	4.44	23.35	24	34	25	17	36.00	34.30	4.9
3199	Lister's Ground Bone	3.53	13.98	23	22	20	25	30.00	19.54	53.5

† Also contains .94 per cent. of potash.

2. *Manufacturers' Samples.* 3. *Samples drawn by private individuals.*

Here are given analyses of samples sent to the Station by the manufacturers. No samples of these brands were drawn by the sampling agents, and it is therefore necessary,—to meet the requirement of the law which calls for an annual analysis of each brand—to analyze the samples deposited at the Station by manufacturers. With these are the analyses of two samples drawn by private individuals.

3272. Al Bone, ground by the National Fertilizer Co., Bridgeport, for C. Buckingham, Southport, who is the dealer. Sampled and sent by C. Buckingham.

3280. Oak Lawn Pure Ground Bone made and sampled by A. F. Hewitt, Groton.

3355. Ground Bone, made and sampled by H. C. Hull, Meriden.

3296. Ground Bone, made and sampled by the Rogers Manufacturing Co., Rockfall, Conn.

3116. Fertilizer made by Plumb and Winton. Sampled and sent by Wm. R. Hopson, Bridgeport.

3122. H. J. Baker's Pure Raw Bone, extra fine. Sampled and sent by W. F. Andross, East Hartford.

MECHANICAL ANALYSES.

	3272	**3280**	**3355**	**3296**	**3116**	**3122**
Fine, smaller than $\frac{1}{50}$ inch	55	61	5	36	50	47
Fine medium, smaller than $\frac{1}{25}$ inch	38	22	6	32	20	53
Medium, smaller than $\frac{1}{12}$ inch	5	12	9	30	22	0
Coarse, coarser than $\frac{1}{12}$ inch	2	5	80	2	8	0
	100	100	100	100	100	100

CHEMICAL ANALYSES.

	3272	**3280**	**3355**	**3296**	**3116**	**3122**
Nitrogen	3.98	2.77	4.16	2.66	5.54	3.72
Phosphoric acid	16.25	27.04	21.40	26.93	13.41	24.65
Valuation per ton	$30.95	40.74	21.87	37.16	31.74	41.34

TANKAGE.

This name is properly applied only to the sediment remaining in tanks where meat scrap with some bone is rendered to separate the fat. After boiling or superheating with steam, the fat rises to the surface of the water and is removed, the soup is run off, and the settlings at the bottom are dried and sold as tankage. Such material contains as large or larger percentage of nitrogen than of phosphoric acid. But the name tankage is also loosely applied to mixtures that consist largely of bone and do not differ greatly in composition from pure bone.

1. *Sampled by Station Agent.*

3216. Blood Bone and Meat from the Quinnipiac Co. Sampled from stock of the dealer, Olds & Whipple, Hartford.

3135. Blood Bone and Meat. Sampled from stock of L. Sanderson, New Haven.

3139. Pulverized Bone and Meat. Sampled from stock of L. Sanderson.

2. *Manufacturer's Sample and Samples drawn by private individuals.*

3275. Blood and Meat Tankage made by F. S. Andrew & Co., New Haven. Sampled by F. S. Andrew.

3149. Tankage sold by Bowker Fertilizer Co., Boston. Sampled by T. J. Stroud from stock of A. D. Bridge, Hazardville.

3186. Dried Blood and Animal Matter from Quinnipiac Co. Sampled by E. F. Thompson, Warehouse Point, from stock bought of Olds & Whipple, Hartford.

3130. Pulverized Bone and Meat, and **3129** Blood Bone and Meat. Both from L. Sanderson, New Haven. Sampled and sent by E. F. Thompson, Warehouse Point.

3169. Tankage made by Daniel S. Wadsworth, Hartford. Sampled and sent by Aug. Pouleur, Windsor.

3372. Tankage made by Daniel S. Wadsworth, Hartford. Sampled by R. E. Pinney, Suffield.

ANALYSES OF TANKAGE.

Station No.	Name or Brand.	Chemical Analysis.		Mechanical Analysis.					Cost per ton.	Valuation per ton.
				Finer than				Coarser than		
		Nitrogen.	Phos. acid.	$\frac{1}{50}$ inch.	$\frac{1}{25}$ inch.	$\frac{1}{12}$ inch.	$\frac{1}{6}$ inch.	$\frac{1}{6}$ inch.		
3216	Quinnipiac Co's. Blood, Bone and Meat	4.93	13.61	64	22	13	1	--	$32.00	$32.18
3135	Sanderson's Blood, Bone and Meat	5.80	15.43	61	19	17	3	--	35.00	34.46
3139	Sanderson's Pulverized Bone and Meat	5.14	20.58	84	12	3	11	--	36.00	42.41
3275	F. S. Andrews & Co's. Blood and Meat Tankage	4.02	18.14	15	26	27	32	--	----	25 22
3149	Bowker's Tankage	6.41	15.33	45	25	21	9	--	----	33.51
3186	Olds & Whipple's Dried Blood and Animal Matter	5.65	18.04	71	17	12	--	--	----	38.90
3130	Sanderson's Pulverized Bone and Meat	5.71	19.16	87	10	3	--	--	35.00	42.58
3129	Sanderson's Blood, Bone and Meat	7.93	10.81	61	19	16	4	--	35.00	34.30
3169	D. S. Wadworth's Tankage	3.56	24.26	46	18	20	16	--	25.00	35.79
3372	Wadworth's Tankage	2.79	26.11	28	10	8	54	--	20.00	29.15

Dried and Acidulated Dried Fish.

3351. Bowker's Dry Fish. Sampled by manufacturer, contained 7.93 per cent. of nitrogen, equivalent to 9.63 per cent. of ammonia.

3219. Bowker's Dry Fish. Sampled by Station agent from stock of F. S. Bidwell, Windsor Locks, and Bucklin & Hardin, North Glastonbury. To this analysis the manufacturers object that it does not represent the character of the goods; as all dry fish that has left their factory this year they are very positive is fully up to guarantee. On account of this protest sample **3351** was analyzed and shows one-half of one per cent. more nitrogen. Sample **3219** contains 7.45 per cent. nitrogen, equivalent to 9.05 per cent. ammonia.

3345. Pure Ground Acidulated Fish, made by Luce Bros., Niantic. Sample sent by manufacturers contains 7.19 per cent. nitrogen, equivalent to 8.72 per cent. of ammonia.

MIXED FERTILIZERS.

I. Bone and Potash.

3350. Bone, Meat and Potash, made by F. Nuhn, Waterbury. Sampled by Station agent.

3329. Flour of Bone Phosphate, made by G. W. Miller, Middlefield. Sampled by Station agent.

3343. Fairchild's Bone and Potash for Seeding Down, made by The Rogers & Hubbard Co., Middletown. Sampled by Station agent.

3339. Ground Bone and Potash, made by E. Frank Coe, New York. Manufacturer's sample.

3341. Bone and Potash, Circle Brand, made by Bradley Fertilizer Co., Boston, Mass. Manufacturer's sample.

The sample **3329** is a mixture of bone flour with nitrate of soda and potash salts.

Analyses of Bone and Potash.

Mechanical Analyses.

	3350	**3329**	**3343**	**3339**	**3341**
Fine, smaller than $\frac{1}{50}$ inch	47	64	63	50	45
Fine medium, smaller than $\frac{1}{25}$ inch	25	29	28	22	38
Medium, smaller than $\frac{1}{12}$ inch	14	7	8	15	16
Coarse, larger than $\frac{1}{12}$ inch	14	0	1	13	1
	100	100	100	100	100

CHEMICAL ANALYSES.

	3350	3329	3343	3339	3341
Nitrogen as nitrate	----	1.48	----	----	----
Nitrogen as ammonia	.15	.19	----	----	----
Nitrogen, organic	3.93	2.94	2.84	2.22	2.91
Nitrogen, total	4.08	4.61	2.84	2.22	2.91
Phosphoric acid	20.39	13.82	18.75	21.42	16.71
Potash	1.07	5.66	13.42	1.11	2.24
Chlorine	1.24	5.27	13.04	2.64	3.00
Cost per ton	$32.50	35.00	42.50	----	----
Valuation per ton	$34.62	35.96	43.61	31.33	29.94

II. NITROGENOUS SUPERPHOSPHATES AND GUANOS.

Here are included those mixed fertilizers containing nitrogen, phosphoric acid and in most cases potash, which are not designed by their manufacturers for use on any special crop. "Special Manures" are noticed further on. Fish scrap is here included as it is sometimes acidulated with oil of vitriol to preserve it, thus making it a nitrogenous superphosphate.

1. *Samples drawn by Station Agents.*

In the tables on pages 44 to 57 are tabulated the analyses of fifty-seven brands made on samples collected by the Station agents.

THE GUARANTEES.

The law of Connecticut requires every package of fertilizer to bear a statement of the actual composition of the goods. This usually expresses the quantities of nitrogen, phosphoric acid and potash within certain limits, as "nitrogen 2-4 per cent."

If a fertilizer with such a guarantee actually contains 2 per cent. of nitrogen, it is within the manufacturer's guarantee.

It is the lowest figures of the guarantee therefore that purchasers should regard.

Of the fifty-seven brands here reported fourteen are below their minimum guarantee in respect of one ingredient, and six in respect of two ingredients. That is, one-third of all the nitrogenous superphosphates in our market contain less of one or of several ingredients than they are claimed to contain.

It may be urged that an excess of one ingredient over the guarantee should be held to make good the deficiency of another. But with reasonable care and skill in the manufacture and in the sampling and analysis of the goods the actual analysis should not fall below the minimum guaranteed in any respect particularly when such wide limits are allowed in the guarantees themselves.

The Actual Chemical Composition.

The different brands differ greatly in composition.

Below are given the highest and lowest percentages of each ingredient and also the average composition of the nitrogenous superphosphates.

The samples of dry ground fish, Peruvian guano and bone treated with oil of vitriol are not included in this table.

Composition of Nitrogenous Superphosphates. Season of 1891.

	Highest.	Lowest.	Average.
Nitrogen as nitrates	1.08	0	.14
" " ammonia	2.55	0	.28
" organic	6.06	.73	2.47
Total Nitrogen	6.06	.73	2.89
Soluble Phosphoric Acid	10.51	1.31	5.71
Reverted " "	8.04	1.19	3.19
Insoluble " "	2.85	.15	1.34
Available Phosphoric Acid	12.97	4.23	8.90
Total " "	14.78	5.19	10.24
Potash	9.95	.93	3.48
Chlorine	7.88	none	3.35
Cost per ton*	$44.00	$25.00	$33.93
Valuation per ton*	$34.18	$19.90	$28.13

* Excluding the last two analyses in the table, in which the cost exceeds valuation by considerably more than 50 per cent.

This table shows that the nitrogen in the nitrogenous superphosphates now in market varies from three-quarters of one per cent. to six per cent., phosphoric acid from five to fourteen and three-quarters per cent., and potash from less than one per cent. to ten.

It is evident that among the various brands there is a great difference in the quantity of actually valuable ingredients per ton and these differences must be studied by any one who would purchase economically.

A comparison of these tables with those of former years will also show that certain brands have about the same composition year after year, while others fluctuate considerably and cannot be depended on to be the same from year to year.

COST AND VALUATION.

Cost.

The method used to ascertain the retail cash price of the phosphates is as follows :

The sampling agents inquire and note the price at the time each sample is drawn. The analysis when done is reported to each dealer from whom a sample was taken with an enclosed postal card addressed to the Station, and a request to note on it whether the retail cash price is correctly given and to mail to the Station.

To each manufacturer is also sent a request that he will notify the Station regarding the probable average cash price at freight centers in Connecticut, of such brands as he sells in the State.

From these data the average prices are computed.

Valuation.

The valuation has been computed in all cases as already described in detail on page 24.

Percentage Difference given in the last column of the table shows the percentage excess of the cost price over the average retail cost of the nitrogen, phosphoric acid and potash contained in the fertilizer.

This information puts the purchaser into a position where he can figure as to the probable relative value of the different brands and the probable relative economy of buying fertilizers mixed or unmixed.

Which method of buying is preferable can only be determined by each individual farmer who should know best what his soil and crops need and what his facilities for purchase and payment are.

No general rule can be given. In one case ready-mixed, in another, home-mixed fertilizers may be found the more profitable to use.

The average cost of the nitrogenous superphosphates as already given is $33.93. The average valuation, $28.13 and the percentage difference 20.6.

Last year the corresponding figures were :

Average cost $33.80, Average valuation $28.57, Percentage difference 18.3.

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3183	Acidulated Fish Guano.	Leander Wilcox, Mystic, Conn.	H. K. Brainard, Thompsonville.	$20.00
3136	Dry Ground Fish.	L. Sanderson, New Haven, Conn.	Manufacturer.	30.00
3344	Pure Fine Dissolved Bone.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	Mapes' Branch, Hartford.	32.00
3172	Dry Ground Fish Guano.	Leander Wilcox, Mystic, Conn.	H. K. Brainard, Thompsonville.	33.00
			W. W. Cooper, Suffield.	35.00
			Manufacturer.	30.00
			J. W. Reynolds, Goodspeeds.	30.00
3253	Pure Dry Ground Menhaden Guano, A.	Joseph Church & Co., Tiverton, R. I.	Manufacturer.	34.00
3234	Cumberland Bone Superphosphate.	Cumberland Bone Co., Portland, Me.	L. D. Post, Andover.	30.00
3257	Dry Ground Fish.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	D. W. Spencer, Centerbrook.	32.00
			J. E. Holmes, Stratford.	38.00
			W. F. Andross, E. Hartford.	35.00
			R. A. Parker, Warehouse Point.	34.00
3232	Bone, Fish and Potash.	E. R. Kelsey, Branford, Conn.	Wilson & Burr, Middletown.	28.00
			J. R. Barnes, Cheshire.	25.00
			Manufacturer.	20.00
3320	Sanderson's Formula A.	L. Sanderson, New Haven, Conn.	Manufacturer.	35.00
			E. A. Atwater, Cheshire.	36.00
3213	Dry Ground Fish.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	J. F. Silliman, New Canaan.	36.00
			P. & G. Williams, New London.	40.00
3331	Chittenden's Fish and Potash.	National Fertilizer Co., Bridgeport, Conn.	G. A. & H. B. Williams, E. Hartford.	32.00
			Prindle & Clark, W. Cheshire.	33.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3255	Standard C Brand Fertilizer.	Joseph Church & Co., Tiverton, R. I.	Manufacturer.	$35.00
3254	Special B Brand Fertilizer.	Joseph Church & Co., Tiverton, R. I.	Manufacturer.	37.00
3336	Swift Sure Superphosphate.	M. L. Shoemaker & Co., Philadelphia, Pa.	Wm. H. Filley, Windsor.	40.00
			J. P. Barstow & Co., Norwich.	37.00
			F. Ellsworth, Hartford.	38.00
3321	Genuine Peruvian Guano.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	Mapes' Conn. Valley Branch, Hartford.	41.00
3291	Complete Manure, A Brand.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	D. B. Wilson, Waterbury.	36.00
			Birdsey & Foster, Meriden.	36.00
			F. S. Bidwell, Windsor Locks.	36.00
			Quinnebaug Store, Danielsonville.	37.00
			Mapes' Conn. Valley Branch, Hartford.	35.00
			D. Beers, Danbury.	36.00
			Wilson & Burr, Middletown.	36.00
			A. N. Clark, Milford.	37.00
			Southington Lumber & Feed Co., Southington.	35.15
			J. P. Barstow & Co., Norwich.	36.00
			Strong & Backus, Colchester.	34.00
3288	Complete Manure for General Use.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	Southington Lumber & Feed Co., Southington.	35.00
			Mapes' Conn. Valley Branch, Hartford.	38.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3324	Chittenden's Ammoniated Bone Phosphate.	National Fertilizer Co., Bridgeport, Conn.	W. L. Currier, Bridgeport.	$35.00
			E. P. Matherson, Promfret.	----
			E. B. Clark, Milford.	30.00
			G. A. & H. B. Williams, E. Hartford.	32.00
			F. L. Leighton & Co., Wallingford.	35.00
			Prindle & Clark, W. Cheshire.	31.00
			C. D. James, Danielsonville.	----
			J. S. Worthington, Gildersleeve.	----
			D. G. Penfield, Danbury.	35.00
			G. W. Eaton, Plainville.	33.00
3248	Bradley's Farmers New Method Fertilizer.	Bradley Fertilizer Co., 127 Kilby St., Boston, Mass.	J. E. Leonard, Jewett City.	32.00
			City Coal & Wood Co., New Britain.	33.00
			W. F. Andross, E. Hartford.	33.00
			D. N. Clark & Sons, Milford.	29.00
			G. W. Carver, Putnam.	29.00
			G. R. Fowler, Central Village.	34.00
			Carter & Strong, Manchester.	34.00
			D. W. Spencer, Centerbrook.	34.00
			J. M. Young, Norwich.	30.00
			R. D. Williams, Collinsville.	32.00
3235	A. A. Ammoniated Superphosphate.	H. J. Baker & Bro., 215 Pearl St., New York.	E. H. Talcott, Torrington.	37.50
			J. H. Ives, Danbury.	37.50
			A. L. Winton, Bridgeport.	37.50
			H. L. Foote, Brookfield Junction.	37.50
			G. W. Walker, Saybrook.	37.50
			E. F. Hawley, Newtown.	37.50
			W. F. Andross, E. Hartford.	37.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3262	Lister's Standard Phosphate.	Lister's Agricultural Chemical Works, Newark, N. J.	W. H. Parmelee, Essex.	$35.00
3174	High Grade Fish and Potash.	Leander Wilcox, Mystic, Conn.	H. K. Brainard, Thompsonville.	32.00
			F. E. Fowler, Montville.	30.00
			Manufacturer.	31.00
			Manufacturer.	31.00
3334	Pilgrim Fertilizer.	J. S. Reese & Co., 10 Broad St., Baltimore, Md.	H. F. Standish, Andover.	27.00
			A. H. Anderson, Putnam.	32.00
3175	Ammoniated Bone Phosphate.	Leander Wilcox, Mystic, Conn.	Manufacturer.	33.00
			J. W. Reynolds, Goodspeeds.	33.00
3312	Animal Fertilizer.	L. B. Darling Fertilizer Co., Pawtucket, R. I.	City Coal & Wood Co., New Britain.	36.00
			W. W. Cooper, Suffield.	38.00
3333	New England Favorite.	J. S. Reese & Co., 10 Broad St., Baltimore, Md.	Montgomery & Co., Groton.	30.00
			H. F. Standish, Andover.	32.00
			A. H. Anderson, Putnam.	35.00
3306	Quinnipiac Phosphate.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	D. N. Medbury, Pomfret.	35.00
			G. B. Whitehead, Green's Farms.	36.00
			J. F. Silliman, New Canaan.	38.00
			Chandler & Morse, Putnam.	35.00
			G. M. Williams, New London.	35.00
			C. A. Young, Danielsonville.	37.00
			J. P. Little, Columbia.	36.00
			Olds & Whipple, Hartford.	38.00
			J. S. Worthington, Gildersleeve.	35.00
			A. J. Martin, Wallingford.	35.00
			D. C. Wood, Stratford.	37.00
			John Greenwood, Norwalk.	38.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3241	Bradley's Superphosphate.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	Dix & Wells, Wethersfield.	$35.00
			T. F. Powers, Waterford.	34.00
			Strong & Tanner, Winsted.	35.00
			D. Beers, Danbury.	36.00
			Peck Bros., Northfield.	35.00
			S. A. Billings, Meriden.	38.00
			City Coal & Wood Co., New Britain.	35.00
			Quinnebaug Store, Danielsonville.	36.00
			J. E. Leonard, Jewett City.	36.00
			D. N. Clark, Shelton.	35.00
			Wheeler & Howe, Bridgeport.	37.00
			F. S. Bidwell, Windsor Locks.	34.00
			Burtiss & Mead, New Canaan.	38.00
			Warner, Taylor & Curtiss, Sandy Hook.	36.00
			D. W. Spencer, Centerbrook.	38.00
			J. E. Comstock, New London.	36.00
			A. L. Sternberg, Hartford.	35.00
			Carter & Strong, Manchester.	----
			Waterbury & June, Greenwich.	38.00
			H. C. Aborn & Co., Ellington.	35.00
			G. R. Fowler, Central Village.	34.00
			John Wells, Hebron.	39.00
			R. A. Parker, Warehouse Point.	35.00
3227	Fish and Potash, D Brand.	Joseph Church & Co., Tiverton, R. I.	W. W. Cooper, Suffield.	28.00

Nitrogenous Superphosphates and Guanos Sampled by the Station—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3325	Americus Brand Ammoniated Bone Superphosphate.	Williams & Clark Fertilizer Co., 83 Fulton St., New York.	D. B. Wilson, Waterbury.	$35.00
			Strong & Backus, Colchester.	33.00
			Geo. Beaumont, Wallingford.	35.00
			C. E. Stagg, Stratford.	34.00
			Daniel Morgan, Mystic.	35.00
			Joseph Roode, Griswold.	36.00
			H. K. Brainard, Thompsonville.	35.00
			John Wells, Hebron.	----
			J. H. Ray & Son, Greenwich.	32.00
			J. P. Little, Columbia.	36.00
			John Bransfield, Portland.	38.00
			Hale, Day & Co., South Manchester.	36.00
			H. L. Vibberts, Manchester.	40.00
			T. C. Greene, Torrington.	37.00
			J. P. Kingsley & Sons, Plainfield.	33.00
3309	Market Garden Phosphate.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	G. B. Whitehead, Green's Farms.	40.00
			E. B. Clark, Milford.	39.00
			J. H. Jennings, Green's Farms.	----
3323	Chittenden's Complete Fertilizer.	National Fertilizer Co., Bridgeport, Conn.	E. H. Wilson, Ellington.	----
			C. D. James, Danielsonville.	40.00
			G. H. & H. B. Williams, E. Hartford.	41.00
			D. G. Penfield, Danbury.	45.00
			J. S. Worthington, Gildersleeve.	40.00
			F. L. Leighton & Co., Wallingford.	42.50
			Prindle & Clark, W. Cheshire.	----
			S. D. Woodruff, Orange.	38.00
			David Fitzgerald, Stratford	42.00
			W. W. Cooper, Suffield.	38.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3335	May Flower Fertilizer.	J. S. Reese & Co., 10 Broad St., Baltimore, Md.	Waldo Tillinghast, Plainfield.	$30.00
			H. F. Standish, Andover.	29.00
			H. H. Davenport, Pomfret.	----
			A. H. Anderson, Putnam.	34.00
3228	High Grade Phosphate.	E. Frank Coe, 16 Burling Slip, New York.	C. H. Lounsbury, Seymour.	36.00
			J. Amidon, Wethersfield.	35.00
			Backus Bros., South Windham.	33.00
			Arnold Rudd, New London.	34.00
			W. C. Reynolds, Goodspeeds.	33.00
			D. N. Clark, Shelton.	38.00
			F. H. & F. W. Tillinghast, Central Village.	32.00
			H. L. Vibberts, Manchester.	35.00
			D. G. Penfield, Danbury.	35.00
			J. P. Barstow & Co., Norwich.	32.00
			W. T. Andrew, Orange.	----
			I. W. Denison, Mystic.	32.00
			F. P. Burr & Co., Middletown.	32.00
			H. S. Hall, 2d, Wallingford.	38.00
3233	Pelican Bone Fertilizer.	H. J. Baker & Bro., 215 Pearl St., New York.	Rodgers Bros., New London.	32.50
			E. J. Dickerman, Mt. Carmel.	32.50
3247	Sea Fowl Guano.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	F. S. Bidwell, Windsor Locks.	33.00
3304	Soluble Pacific Guano.	W. D. Stewart & Co., 7 Exchange Place, Boston, Mass.	John Bransfield, Portland.	38.00
			R. H. Tucker, Saybrook.	35.00
			L. J. Grant, South Windsor.	36.00
			Edward Halladay, Suffield.	36.00
			W. F. Andross, E. Hartford.	36.00
			P. J. Bolan, Waterbury.	35.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3318	Ammoniated Bone Fertilizer.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	J. E. Leonard, Jewett City.	$32.00
			E. M. Brewster, Norwich.	32.00
			N. E. Smith, Woodmont.	30.00
			Waldo Tillinghast, Plainfield.	33.00
			Strong & Backus, Colchester.	31.00
3299	Vegetable Phosphate.	Crocker Fertilizer Co., Buffalo, N. Y.	J. E. Holmes, Ridgefield.	44.00
3246	Fish and Potash, Triangle A Brand.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	G. W. Grant, South Windsor.	32.00
			R. A. Parker, Warehouse Point.	30.00
			D. N. Clark, Shelton.	40.00
			Carter & Strong, Manchester.	33.00
3317	Hill and Drill Phosphate.	Bowker Fertilizer Co., Boston, Mass.	J. M. Williams. Manchester.	38.00
			M. A. Covell, North Grosvenordale.	34.00
			E. F. Miller, Ellington.	34.00
			City Coal & Wood Co., New Britain.	36.00
			J. H. Fish, Newington.	36.00
			W. F. Andross, E. Hartford.	37.00
			B. Curtiss & Son, Stepney.	37.00
			J. H. Larned, Pomfret.	36.00
			M. McNamara, New Milford.	36.00
			E. M. Brewster, Norwich.	38.00
			F. Hallock & Co., Birmingham.	34.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3297	Ammoniated Bone Phosphate.	Crocker Fertilizer Co., Buffalo, N. Y.	Prindle & Clark, W. Cheshire.	----
			H. C. Aborn, Ellington.	$34.00
			G. W. Clark, Milford.	----
			F. N. Barton, Watertown.	36.00
			J. P. Little, Columbia.	37.00
			E. W. Peck, Stratford.	38.00
			John Bransfield, Portland.	----
			H. L. Vibberts, Manchester.	37.00
			C. A. Young, Danielsonville.	36.00
			J. E. Leonard, Jewett City.	35.00
3245	Fish and Potash, Anchor Brand.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	H. C. Aborn, Ellington.	30.00
3311	Fish and Potash, Plain Brand.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	A. J. Martin, Wallingford.	27.00
			M. O. Babcock, Branford.	32.00
3264	High Grade Farmer's Friend Fertilizer.	Read Fertilizer Co., Box 3121, New York.	Prior & Tryon, Middletown.	40.00
			Howard Ives, Cheshire.	42.00
3229	Alkaline Bone.	E. Frank Coe, 16 Burling Slip, New York.	Backus Bros., South Windham.	30.00
			C. H. Lounsbury, Seymour.	32.00
3308	Pine Island Phosphate.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	Olin Wheeler, South Windsor.	----
			Olds & Whipple, Hartford.	35.00

NITROGENOUS SUPERPHOSPHATES AND GUANOS SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3303	New Rival Phosphate.	Crocker Fertilizer Co., Buffalo, New York.	W. L. L. Spencer, Lebanon.	$32.00
			J. A. Weed, New Canaan.	40.00
			M. A. Covell, North Grosvenordale.	32.00
			F. N. Barton, Watertown.	32.00
3230	Gold Brand Excelsior Guano.	E. Frank Coe, 16 Burling Slip, New York.	D. G. Penfield, Danbury.	40.00
			J. Amidon, Wethersfield.	39.00
			Arnold Rudd, New London.	40.00
3256	Fish and Potash.	Read Fertilizer Co., Box 3121, New York.	Howard Ives, Cheshire.	30.00
			Prior & Tryon, Middletown.	28.00
3263	Standard Phosphate.	Read Fertilizer Co., Box 3121, New York.	Prior & Tryon, Middletown.	30.00
			Howard Ives, Cheshire.	32.00
3330	Special Favorite Fertilizer.	Davidge Fertilizer Co., 121 Front St., New York.	J. M. Burke, South Manchester.	34.00
			Waldo Tillinghast, Plainfield.	37.00
3310	Fish and Potash, Crossed Fishes Brand.	Quinnipiac Co., Boston, Mass.	M. A. Covell, North Grosvenordale.	30.00
			M. O. Babcock, Branford.	36.00
			Olin Wheeler, South Windsor.	----
			J. F. Silliman, New Canaan.	38.00
			Olds & Whipple, Hartford.	36.00
3328	Royal Bone Phosphate.	Williams & Clark Fertilizer Co., 83 Fulton St., New York.	John Bransfield, Portland.	30.00
			Dale, Day & Co., South Manchester.	30.00
3358	Acme Fertilizer, No. 2.	Acme Fertilizer Co., Maspeth, L. I.	D. R. Hubbard, Guilford.	45.00
3237	Economical Bone Fertilizer.	Wilkinson & Co , 81 Fulton St., New York.	W. H. Harris, Woodstock.	32.00
3301	Practical Ammoniated Bone Phosphate.	Crocker Fertilizer Co., Buffalo, N. Y.	W. L. L. Spencer, Lebanon.	31.00

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation per Ton.	Percentage Difference between Cost and Valuation.
												Available.							
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.				
3183	L. Wilcox's Acidulated Fish Guano	----	.80	4.95	5.75	----	1.42	2.58	.63	4.63	----	4.00	----	----	----	----	$20.00	$24.67	*18.9
3136	L. Sanderson's Dry Ground Fish	----	----	8.59	8.59	*6.6*	.75	3.37	2.98	7.10	*6.0*	4.12	----	----	----	----	30.00	34.08	*11.9
3344	Mapes' Pure Fine Dissolved Bone	----	----	2.82	2.82	*2.1*	4.88	12.19	2.36	19.43	----	17.07	*12.0*	----	----	----	32.00	35.79	*10.6
3172	L. Wilcox's Dry Ground Fish Guano	----	----	8.90	8.90	*8.0*	.67	3.43	3.09	7.19	*6.0*	4.10	*4.0*	----	----	----	32.00	35.04	*8.6
3253	Church's Dry Ground Menhaden Guano	----	----	8.68	8.68	*8.2*	.59	3.84	3.10	7.53	*8.0*	4.43	----	----	----	----	34.00	34.85	*2.5
3234	Cumberland Bone Superphosphate	.30	----	2.25	2.55	*2.5*	5.79	7.18	1.81	14.78	----	12.97	*12.0*	2.25	*3.0*	1.29	30.00	30.74	*2.4
3257	Bradley's Dry Ground Fish	----	----	8.57	8.57	*7.4*	.61	3.64	3.36	7.61	*7.0*	4.25	----	----	----	----	34.50	34.36	.4
3232	Kelsey's Bone, Fish and Potash	----	.74	3.41	4.15	*3.3*	3.07	2.10	.38	5.55	*4.0*	5.17	----	3.00	*3.0*	.22	25.00	24.76	1.0
3320	Sanderson's Formula A	1.08	.69	2.43	4.20	*3.3*	6.69	3.48	.15	10.32	*10.0*	10.17	*6.0*	5.54	*6.0*	4.32	35.00	34.18	2.4
3213	Quinnipiac Co.'s Dry Ground Fish	----	.26	8.33	8.59	*7.4*	.48	4.15	2.60	7.23	*7.0*	4.63	*4.0*	----	----	----	36.00	34.82	3.3
3331	Chittenden's Fish and Potash	----	.46	4.38	4.84	*3.3*	3.60	2.79	1.31	7.70	*6.0*	6.39	----	6.13	*5.0*	4.91	32.50	31.27	3.9
3255	Church's Standard C Brand Fertilizer	----	.32	3.70	4.02	*3.3*	6.80	2.64	.92	10.36	*10.0*	9.44	----	4.11	*4.0*	1.68	35.00	31.94	9.6
3254	Church's Special B Brand	----	----	6.06	6.06	*4.9*	3.46	2.91	1.42	7.79	*12.0*	6.37	----	4.93	*6.0*	5.40	37.00	33.71	9.7

* Valuation exceeds cost.

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation per Ton.	Percentage Difference between Cost and Valuation.
												Available.							
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Found.	Guaranteed.	Found.	Guaranteed.				
3336	Shoemaker's Swift Sure Superphosphate	.80	----	2.25	3.05	*2.5*	7.38	4.36	2.40	14.14	*14.0*	11.74	*9.0*	4.76	*4.0*	none	$38.00	$33.85	12.2
3321	Mapes' Genuine Peruvian Guano	----	1.83	.97	2.80	*3.3*	3.38	8.92	9.90	22.20	*23.0*	12.30	----	3.09	*3.0*	2.03	41.00	35.39	15.9
3291	Mapes' Complete Manure, A Brand	.64	.60	1.79	3.03	*2.5*	8.48	2.86	1.63	12.97	*12.0*	11.34	*10.0*	3.21	*2.5*	3.04	36.00	31.03	16.0
3288	Mapes' Complete Manure for General Use	.62	1.00	2.06	3.68	*3.3*	6.72	3.54	1.38	11.64	----	10.26	*8.0*	4.42	*4.0*	2.47	38.00	32.70	16.2
3324	Chittenden's Ammoniated Bone Phosphate	----	----	2.52	2.52	*1.7*	6.88	3.75	1.95	12.58	*9.0*	10.63	*7.0*	2.58	*2.0*	1.25	33.00	27.73	19.0
3248	Bradley's Farmers' New Method Fertilizer	----	----	2.38	2.38	*1.7*	7.20	2.97	1.95	12 12	*10.0*	10.17	*8.0*	3.03	*3.0*	2.75	32.00	26.87	19.1
3235	Baker's A.A. Ammoniated Superphosphate	trace	1.85	.96	2.81	*2.5*	10.51	1.27	.38	12.16	*11.0*	11.78	*10.0*	2.83	*2.0*	3.86	37.50	31.25	20.0
3262	Lister's Standard Phosphate	----	.46	2.07	2.53	*2.1*	7.89	4.14	2.45	14.48	*12.0*	12 03	*10.0*	1.09	*1.5*	.23	35.00	29.07	20.4
3174	Wilcox's High Grade Fish and Potash	----	.45	3.45	3.90	*3.3*	3.52	2.17	.73	6.42	*6.0*	5.69	*5.0*	4.63	*4.0*	7.74	31.00	25.70	20.7
3334	Reese's Pilgrim Fertilizer	----	----	1.53	1.53	*1.0*	2.88	8.04	.40	11.32	*7.5*	10.92	*6.5*	2.51	----	2.23	29.00	23.83	21.7
3175	Wilcox's Ammoniated Bone Phosphate	----	.39	3.47	3.86	*3.3*	4.19	2.16	.74	7.09	*7.0*	6.35	*6.0*	5.32	*5.0*	6.21	33.00	27.12	21.7
3312	Darling's Animal Fertilizer	.38	----	3.31	3.69	*3.3*	4.54	3.57	1.54	9.65	*10.0*	8.11	----	5.47	*4.0*	5.30	36.00	29.52	21.9
3333	Reese's New England Favorite	----	----	2.72	2.72	*2.4*	4.03	6.23	.37	10.63	*11.0*	10.26	*9.0*	1.84	*2.0*	2.33	32.00	26.04	22.9
3306	Quinnipiac Phosphate	.08	----	2.97	3.05	*2.5*	6.81	3.73	1.66	12.20	*10.0*	10.54	*9.0*	1.99	*2.0*	1.88	35.00	28.39	23.3
3241	Bradley's Superphosphate	.18	----	2.59	2.77	*2.5*	7.82	3.17	1.36	12.35	*11.0*	10.99	*9.0*	2.20	*2.0*	2.65	35.00	28.34	23.5

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation per Ton.	Percentage Difference between Cost and Valuation.
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Available.		Found.	Guaranteed.				
												Found.	Guaranteed.						
3227	Church's Fish and Potash	----	----	4.18	4.18	*3.3*	1.31	2.92	.96	5.19	*5.0*	4.23	----	3.09	*3.0*	5.44	$28.00	$22.60	23.9
3325	Americus Ammoniated Bone Phosphate	.08	----	2.75	2.83	*2.5*	7.28	3.73	.72	11.73	*10.0*	11.01	*9.0*	2.04	*2.0*	1.58	35.00	28.14	24.4
3309	Quinnipiac Market Garden Phosphate	.26	.64	2.48	3.38	*3.3*	6.03	1.95	.50	8.48	*9.0*	7.98	*8.0*	7.83	*7.0*	1.27	40.00	31.86	25.5
3323	Chittenden's Complete Fertilizer	.57	----	2.77	3.34	*3.3*	4.56	5.80	2.56	12.92	*8.0*	10.36	*6.0*	6.22	*6.0*	5.81	41.50	32.86	26.3
3335	Reese's Mayflower Fertilizer	----	----	2.02	2.02	*1.8*	3.25	7.62	.45	11.32	*10.0*	10.87	*8.5*	1.57	*2.3*	3.30	31.00	24.48	26.6
3228	E. F. Coe's High Grade Phosphate	---	.60	1.72	2.32	*2.0*	7.87	2.22	2.05	12.14	*11.0*	10.09	*9.0*	2.41	*3.0*	.40	34.00	26.84	26.7
3233	Baker's Pelican Bone Fertilizer	----	1.27	.91	2.18	*1.8*	8.46	1.19	.26	9.91	*9.0*	9.65	*8.0*	2.85	*2.3*	6.18	32.50	25.53	27.3
3247	Bradley's Sea Fowl Guano	----	----	2.42	2.42	*2.5*	6.90	2.92	1.93	11.75	*11.0*	9.82	*9.0*	2.41	*2.0*	2.22	33.00	25.87	27.5
3304	Stewart's Soluble Pacific Guano	.11	.23	2.44	2.78	*2.3*	7.13	2.69	1.52	11.34	*10.5*	9.82	*8.5*	2.76	*2.0*	2.00	35.00	27.30	28.2
3318	Bowker's Ammoniated Bone Fertilizer	.58	----	1.63	2.21	*2.0*	7.30	2.38	1.62	11.30	*10.0*	9.68	*8.0*	2.05	*2.0*	3.09	32.00	24.48	30.7
3299	Crocker's Vegetable Phosphate	----	.12	4.85	4.97	*5.0*	4.56	2.00	1.13	7.69	*7.0*	6.56	*6.0*	8.24	*6.0*	7.88	44.00	33.65	30.7
3246	Bradley's Fish and Potash, Triangle A Brand	----	----	2.97	2.97	*2.0*	4.50	2.02	1.66	8.18	*6.0*	6.52	*4.0*	3.75	*4.0*	5.10	31.00	23.49	32.0
3317	Bowker's Hill and Drill Phosphate	.87	----	1.97	2.84	*2.5*	8.00	2.48	1.76	12.24	*12.0*	10.48	*8.0*	2.37	*2.0*	2.29	37.00	27.98	32.2
3297	Crocker's Ammoniated Bone Phosphate	---	----	2.88	2.88	*2.9*	5.17	5.07	2.66	12.90	*11.0*	10.24	*10.0*	.93	*1.0*	1.46	35.50	26.71	32.9

ANALYSES OF NITROGENOUS SUPERPHOSPHATES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation per Ton.	Percentage Difference between Cost and Valuation.
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Available.		Found.	Guaranteed.				
												Found.	Guaranteed.						
3245	Bradley's Fish and Potash, Anchor Brand	----	----	3.53	3.53	*2.2*	2.99	2.97	2.18	8.14	*5.0*	5.96	*3.0*	3.29	*3.0*	5.32	$32.00	$24.01	33.5
3311	Quinnipiac Fish and Potash, Plain Brand	----	----	2.87	2.87	*2.0*	3.23	2.39	1.26	6.88	*6.0*	5.62	*4.0*	3.81	*4.0*	6.40	29.00	21.60	34.2
3264	Read's High Grade Farmer's Friend	----	----	3.22	3.22	*3.3*	4.24	1.90	1.18	7.32	----	6.14	*5.0*	9.95	*10.0*	7.46	40.00	29.05	37.6
3229	E. Frank Coe's Alkaline Bone	----	----	1.07	1.07	*1.0*	7.56	2.99	1.73	12.28	*9.0*	10.55	*9.0*	1.74	*3.0*	.25	31.00	22.44	38.1
3308	Quinnipiac Pine Island Phosphate	----	.23	2.36	2.59	*2.1*	6.02	2.97	1.15	10.14	*10.0*	8.99	*9.0*	1.37	*1.0*	1.39	34.00	23.95	41.9
3303	Crocker's New Rival Phosphate	----	----	1.51	1.51	*1.2*	6.06	3.89	1.82	11.77	*11.0*	9.95	*10.0*	1.41	*1.6*	2.40	32.00	22.22	44.0
3230	E. F. Coe's Excelsior Guano, Gold Brand	----	1.27	1.04	2.31	*2.5*	6.45	2.68	1.94	11.07	*9.0*	9.13	*8.0*	4.75	*6.0*	1.79	40.00	27.79	43.9
3256	Read's Fish and Potash	----	----	2.59	2.59	*2.5*	3.39	1.66	.77	5.82	*6.0*	5.05	*4.0*	4.30	*4.0*	5.86	29.00	20.12	44.1
3263	Read's Standard Phosphate	trace	---	1.13	1.13	*0.8*	7.20	1.40	.51	9.11	*10.0*	8.60	*8.0*	4.23	*4.0*	6.28	31.00	21.14	46.6
3330	Davidge Special Favorite	----	----	1.64	1.64	*1.2*	8.35	2.59	.19	11.13	*11.0*	10.94	*10.0*	1.60	*1.5*	1.52	35.00	23.86	46.7
3310	Quinnipiac Fish and Potash, Crossed Fishes Brand	----	----	3.43	3.43	*3.3*	2.88	2.61	1.79	7.28	*5.0*	5.49	*3.0*	3.64	*3.0*	5.80	34.00	23.16	46.8
3328	Williams & Clark's Royal Bone Phosphate	----	----	1.09	1.09	*1.0*	6.56	2.60	1.15	10.31	*8.0*	9.16	*7.0*	1.71	*2.0*	.85	30.00	19.90	50.8
3358	Acme Fertilizer, No. 2	----	2.55	1.47	4.02	*4.9*	3.92	2.20	2.85	8.97	*8.0*	6.12	----	4.88	*5.0*	4.45	45.00	29.09	54.7
3237	Wilkinson's Economical Bone Fertilizer	----	----	1.07	1.07	*2.1*	4.70	2.15	.67	7.52	*6.0*	6.85	----	2.67	*3.0*	5.60	27.00	16.74	61.5
3301	Crocker's Practical Ammoniated Bone Phosphate	----	----	.73	.73	*0.8*	5.69	3.43	1.95	11.07	*9.0*	9.12	*8.0*	1.41	*1.0*	1.39	31.00	18.56	67.0

FISH AND POTASH.

On page 59 the different brands of Fish and Potash are tabulated by themselves, though they are also included in the tables of nitrogenous superphosphates on pages 44 to 57.

They contain from 2.6 to 4.8 per cent. of nitrogen, 5.2 to 8.2 per cent. of phosphoric acid and from 3.0 to 6.0 per cent. of potash.

The following two analyses are not included in the tables of superphosphates already given.

3202. Read's Standard Fertilizer. Sample drawn by M. S. Baldwin, Naugatuck, from stock of Frank Truesdell, Naugatuck.

3319. Bristol Fish and Potash. Made by Bowker Fertilizer Co., Boston. Sampled by Station agent from stock of E. M. Brewster, Norwich, and B. Curtiss & Sons, Stepney.

The manufacturers state that not over five tons of this brand—which is totally distinct from their "Bowker's Fish and Potash"—were shipped into Connecticut this year, and that the brand has been withdrawn from the State.

ANALYSES.

	3202	**3319**
Nitrogen, organic	.97	1.13
Soluble phosphoric acid	6.40	7.54
Reverted " "	2.37	2.24
Insoluble " "	1.21	2.62
Potash	3.88	1.17
Chlorine	6.07	1.59
Cost per ton	$35.00	----
Valuation per ton	$20.78	21.03

2. *Manufacturers' Samples.*

3342. Original Coe's Superphosphate, made by Bradley Fertilizer Co., Boston, Mass.

3375. Buffalo Superphosphate, No. 2, made by Crocker Fertilizer Co., Buffalo, N. Y.

3376. Niagara Phosphate, made by Crocker Fertilizer Co., Buffalo, N. Y.

3377. Queen City Phosphate, made by Crocker Fertilizer Co., Buffalo, N. Y.

3337. Extra Bone Phosphate, made by L. B. Darling Fertilizer Co., Pawtucket, R. I.

FISH AND POTASH.—SAMPLED BY THE STATION.

	Kelsey's.	Chittenden's.	Wilcox's.	Church's.	Bradley's Triangle A.	Bradley's Anchor Brand.	Quinnipiac Plain Brand.	Read's.	Quinnipiac Crossed Fishes Brand.
	3232	**3331**	**3174**	**3227**	**3246**	**3245**	**3311**	**3256**	**3310**
Nitrogen as Ammonia	.74	.46	.45	- - -	- - -	- - -	- - -	- - -	- - -
Nitrogen, Organic	3.41	4.38	3.45	4.18	2.97	3.53	2.87	2.59	3.43
Soluble Phosphoric Acid	3.07	3.60	3.52	1.31	4.50	2.99	3.23	3.39	2.88
Reverted Phosphoric Acid	2.10	2.79	2.17	2.92	2.02	2.97	2.39	1.66	2.61
Insoluble Phosphoric Acid	.38	1.31	.73	.96	1.66	2.18	1.26	.77	1.79
Potash	3.00	6.13	4.63	3.09	3.75	3.29	3.81	4.30	3.64
Cost	$25.00	$32.50	$31.00	$28.00	$31.00	$32.00	$29.00	$29.00	$34.00
Valuation	24.76	31.27	25.70	22.60	23.49	24.01	21.60	20.12	23.16

3340. Ammoniated Dissolved Bone Phosphate, made by Lister's Agricultural Chemical Works, Newark, N. J.

3338. IXL Ammoniated Bone Superphosphate, made by the Miles Fertilizer & Oil Co., Milford, Conn.

III. SPECIAL MANURES.

1. *Sampled by Station Agents.*

For Analyses and Valuations see pages 62 *to* 73.

Here are included such Nitrogenous Superphosphates as are claimed by their manufacturers to be specially adapted to the needs of particular crops.

GUARANTEES.

Eleven brands are below the maker's guarantee in respect of one ingredient, two in respect of two ingredients, and one brand is below in all three.

ACTUAL COMPOSITION.

Below are given the highest and lowest percentage of each ingredient found in any special manure as well as their average composition.

COMPOSITION OF SPECIAL MANURES.

	Highest.	Lowest.	Average.
Nitrogen as nitrate	5.08	none.	.62
" " ammonia	3.90	none.	.85
" organic	3.90	none.	2.25
Total nitrogen	6.90	1.15	3.72
Soluble Phosphoric Acid	7.65	none.	5.05
Reverted " "	9.16	1.13	2.77
Insoluble " "	7.56	.11	1.57
Readily available Phosph. Acid	10.36	4.38	7.82
Total	16.72	5.36	9.39
Potash	11.66	1.54	6.74
Cost per ton	$50.00	$33.00	$38.84
Valuation per ton	$46.35	$21.42	$31.64

A comparison of the average composition of these special manures with that of the other nitrogenous superphosphates shows the former to contain, on the whole, considerably more nitrogen, nearly twice as much potash and somewhat less phosphoric acid than the latter.

COST, VALUATION AND PERCENTAGE DIFFERENCE.

The average cost per ton of the special manures has been $38.84, the average valuation, $31.64 and the percentage difference 22.8, a little higher than in case of the nitrogenous superphosphates.

Last year the corresponding figures were: Average cost $39.18, average valuation $32.90, percentage difference 19.0.

MANUFACTURER'S SAMPLES—ANALYSES AND VALUATIONS.

	3342	**3375**	**3376**	**3377**	**3337**	**3340**	**3338**
Nitrogen as nitrates	----	----	----	----	.58	----	----
Nitrogen as ammonia	----	----	----	----	----	.42	.29
Nitrogen, organic	2.60	----	----	1.98	3.34	2.18	2.03
Total nitrogen found	2.60	----	----	1.98	3.92	2.50	2.32
NITROGEN GUARANTEED	**2.1**	----	----	**1.7**	----	**1.8**	----
Soluble phosphoric acid	6.91	10.66	10.59	8.70	4.19	7.45	7.92
Reverted phosphoric acid	5.15	2.87	2.90	2.68	4.89	4.14	1.75
Insoluble phosphoric acid	1.61	trace	2.69	.21	1.74	2.64	.03
Total phosphoric acid found	13.65	13.53	16.18	11.59	10.82	14.23	9.70
PHOSPHORIC ACID GUARANTEED	**10.0**	**12.0**	**12.5**	----	----	**11.0**	----
Available phosphoric acid found	12.04	13.53	13.49	11.38	9.08	11.59	9.67
AVAILABLE PHOSPHORIC ACID GUARANTEED	**8.0**	**11.0**	**11.5**	**8.0**	----	**9.0**	----
Potash	1.43	2.78	----	2.03	3.96	1.60	1.72
POTASH GUARANTEED	**1.0**	**1.4**	----	**1.0**	----	**1.5**	----
Chlorine	1.77	3.14	----	1.82	1.11	----	1.64
Valuation per ton	$28.74	23.87	22.37	25.99	30.84	29.27	24.22

SPECIAL MANURES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3260	Fairchild's Formula for Corn and General Crops.	Rogers & Hubbard Co., Middletown, Conn.	Strong & Backus, Colchester.	$44.00
3322	Seeding Down Manure.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	Mapes' Conn. Valley Branch, Hartford.	37.50
3314	Stockbridge Manure for Tobacco.	Bowker Fertilizer Co., 43 Chatham St., Boston, Mass.	H. K. Brainard, Thompsonville.	50.00
3287	Grass and Grain Spring Top Dressing.	Mapes' Formula & Peruvian Guano Co., New York.	F. S. Bidwell, Windsor Locks.	40.00
			Strong & Backus, Colchester.	39.00
			G. K. Nason, Willimantic.	39.00
			Mapes' Conn. Valley Branch, Hartford.	39.00
			Soule & Staub, New Milford.	41.00
3289	Manure for Fruit and Vines.	Mapes' Formula & Peruvian Guano Co., New York.	Mapes' Conn. Valley Branch, Hartford.	38.00
			E. N. Pierce & Co., Plainville.	40.00
3259	Soluble Potato Manure.	Rogers & Hubbard Co., Middletown, Conn.	A. E. Kilburn, East Hartford.	37.00
			G. L. Foskett, Winsted.	37.00
			City Coal & Wood Co., New Britain.	37.00
			Strong & Backus, Colchester.	36.00
			Daniel Moriarty, South Meriden.	37.00
3292	Complete Manure for Light Soils, or Vegetable Manures.	Mapes' Formula & Peruvian Guano Co., 143 Liberty St., New York.	Mapes' Conn. Valley Branch, Hartford.	42.00
			Wilson & Burr, Middletown.	43.00
			G. K. Nason, Willimantic.	42.00
			Birdsey & Foster, Meriden.	42.00
			J. P. Barstow & Co., Norwich.	43.00
3173	Potato Manure.	Leander Wilcox, Mystic, Conn.	Manufacturer.	34.00
			J. M. Young, Norwich.	35.00
			W. C. Reynolds, Goodspeeds.	32.00
			C. M. Smith, East Hartford.	36.00
			J. A. Lewis, Willimantic.	30.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cashprice per ton.
3171	C. C. C. Special Potato Manure.	Chemical Co. of Canton, Baltimore, Md.	G. L. Foskett, Winsted.	$35.00
3240	High Grade Tobacco Manure.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	A. C. Sternberg, Hartford.	46.00
3261	Lister's Potato Fertilizer.	Lister's Agricultural Chemical Works, Newark, N. J.	E. P. Carroll, East Hartford.	37.00
3332	Concentrated Potato and Corn Manure.	J. S. Reese & Co., 10 Broad St., Baltimore, Md.	H. F. Standish, Andover.	34.00
			Montgomery & Co., Groton.	32.00
3239	Special Tobacco Manure.	H. J. Baker & Bro., 215 Pearl St., New York.	E. F. Hawley, Newtown.	42.00
			L. J. Grant, South Windsor.	40.00
3285	Corn Manure.	Mapes' Formula & Peruvian Guano Co., New York.	F. S. Bidwell, Windsor Locks.	40.00
			W. W. Cooper, Suffield.	41.00
			D. B. Wilson, Watertown.	41.00
			G. K. Nason, Willimantic.	39.00
			W. A. Benton, Guilford.	40.00
			Mapes' Branch, Hartford.	39.00
			W. R. Foote, Branford.	40.00
			Southington Lumber & Feed Co., Southington.	40.00
			E. N. Pierce & Co., Plainville.	40.00
3236	Corn Manure.	Mapes' Formula & Peruvian Guano Co., New York.	D. Beers, Danbury.	39.00
3290	Tobacco Manure, Conn. Brand.	Mapes' Formula & Peruvian Guano Co., New York.	Mapes' Branch, Hartford.	44.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3243	Complete Manure for Potatoes and Vegetables.	Bradley Fertilizer Co., Boston, Mass.	J. F. Ellwood, Southport.	$38.00
			R. A. Parker, Warehouse Point.	36.00
			Strong & Tanner, Winsted.	40.00
			J. A. Lewis, Willimantic.	40.00
			W. H. Cheney's Sons, South Manchester.	42.00
			Dix & Welles, Wethersfield.	40.00
			City Coal & Wood Co., New Britain.	41.00
			Carter & Strong, Manchester.	42.00
3238	Potato Manure.	H. J. Baker & Bro., 215 Pearl St., New York.	E. F. Hawley, Newtown.	42.50
			H. L. Foote, Brookfield Junction.	42.00
			J. H. Ives, Danbury.	42.00
			A. L. Winton, Bridgeport.	42.00
			E. H. Talcott, Torrington.	42.00
			Rodgers Bros., New London.	40.50
			W. F. Andross, East Hartford.	40.00
			E. J. Dickerman, Mt. Carmel.	42.50
3286	Tobacco Manure, Wrapper Brand.	Mapes' Formula & Peruvian Guano Co., New York.	Mapes' Branch, Hartford.	48.00
			Southington Lumber & Feed Co., Southington.	47.50
			F. S. Bidwell, Windsor Locks.	49.00
			Soule & Staub, New Milford.	50.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3293	Potato Manure.	Mapes' Formula & Peruvian Guano Co., New York.	W. R Foote, Branford.	$42.00
			F. S Bidwell, Windsor Locks.	42.00
			Quinnebaug Store, Danielsonville.	43.00
			Wheeler & Howe, Bridgeport.	45.00
			C. W. Beardsley, Milford.	42.00
			Southington Lumber & Feed Co., Southington.	40.50
			E. N. Pierce & Co., Plainville.	42.00
			Wilson & Burr, Middletown.	42.00
			A. N. Clark, Milford.	43.00
			Soule & Staub, New Milford.	43.00
			Mapes' Branch, Hartford.	41.00
			Strong & Backus, Colchester.	41.00
			J. P. Barstow & Co., Norwich.	42.00
			Raymond Bros , South Norwalk.	43.00
			Abbott & Co., Birmingham.	40.00
			D. B. Wilson, Waterbury.	43.00
3313	Potato and Root Crop Manure.	L. B. Darling Fertilizer Co., Pawtucket, R. I.	City Coal & Wood Co., New Britain.	38.00
3327	High Grade Special for Potatoes, Tobacco, Onions and Cabbage.	Williams & Clark Co., 83 Fulton St., New York.	John Bransfield, Portland.	40.00
			Hale. Day & Co., South Manchester.	40.00
			L. J. Grant, South Windsor.	40.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3279	Great Eastern Vegetable, Vine and Tobacco Fertilizer.	Great Eastern Fertilizer Co., Rutland, Vt.	W. A. Bonfoey, Higganum.	$35.00
			S. D. Woodruff, Orange.	35.00
			F. W. Goodrich, Portland.	----
			Wm. Burr & Son, Fairfield.	34.00
			Way & Sanderson, Pomfret.	36.00
			G. H. Law, Killingly.	32.00
3315	Stockbridge Manure for Corn	Bowker Fertilizer Co., Boston, Mass.	Waldo Tillinghast, Plainfield.	40.00
			Lewis Browning, New London.	42.50
			E. J. Dickerman, Mt. Carmel.	43.00
			J. A. Lewis, Willimantic.	40.00
			J. A. Paine, Danielsonville.	40.00
			A. H. Anderson, Putnam.	42.00
			H. E. Mead, Ridgefield.	45.00
			E. F. Miller, Ellington.	38.00
			W. A. Beers, Brookfield Junction.	----
			J. H. Larned, Pomfret.	42.00
			City Coal & Wood Co., New Britain.	41.00
			J. M. Williams, Manchester.	40.00
3300	Special Potato Manure.	Crocker Fertilizer Co., Buffalo, N. Y.	F. H. & F. W. Tillinghast, Central Village.	40.00
			H. L. Vibberts, Manchester.	40.00
			Waldo Tillinghast, Plainfield.	37.00
			E. W. Peck, Stratford.	40.00
			G. W. Clark, Milford.	----
			City Coal & Wood Co., New Britain.	39.00
			E. J. Dickerman, Mt. Carmel.	41.00
			Prindle & Clark, West Cheshire.	37.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3278	Great Eastern Grain and Grass Fertilizer.	Great Eastern Fertilizer Co., Rutland, Vt.	Wm. Burr & Son, Fairfield.	$33.00
			W. A. Snow, Columbia.	35.00
			G. H. Law, Killingly.	32.00
			Way & Sanderson, Pomfret.	36.00
3244	Complete Manure for Corn and Grain.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	Carter & Strong, Manchester.	42.00
			J. E. Holmes, Stratford.	40.00
			D. N. Clark & Sons, Milford.	38.00
3316	Stockbridge Manure for Potatoes and Vegetables.	Bowker Fertilizer Co., Boston, Mass.	F. S. Bidwell, Windsor Locks.	42.00
			Southington Lumber & Feed Co., Southington.	40.50
			A. S. Russell & Co., Meriden.	45.00
			E. B. Clark, Milford.	39.00
			E. J. Dickerman, Mt. Carmel.	43.00
			City Coal & Wood Co., New Britain.	41.00
			N. E. Smith, Woodmont.	40.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cashprice per ton.
3298	Potato, Tobacco and Hop Phosphate.	Crocker Fertilizer Co., Buffalo, N. Y.	H. T. Hart, Burnside.	$36.00
			J. E. Leonard, Jewett City.	35.00
			W. L. L. Spencer, Lebanon.	38.00
			M. H. Aborn & Co., Rockville.	34.00
			E. W. Peck, Stratford.	37.00
			F. N. Barton, Watertown.	36.00
			G. W. Clark, Milford.	----
			W. C. Russell, Orange.	33.00
			J. A. Weed, New Canaan.	37.00
			J. P. Little, Columbia.	38.00
3305	Soluble Pacific Potato Fertilizer.	W. D. Stewart & Co., 7 Exchange Place, Boston, Mass.	P. J. Bolan, Waterbury.	35.00
			R. H. Tucker, Saybrook.	35.00
3357	Potato Fertilizer, Conn. Brand.	Acme Fertilizer Co., Maspeth, L. I.	D. R. Hubbard, Guilford.	38.00
3326	Potato Phosphate.	Williams & Clark Fertilizer Co., New York.	J. P. Kingsley, Plainfield.	33.00
			Chas. Kingsbury, South Coventry.	37.00
			Hale, Day & Co., South Manchester.	36.00
			Geo. Beaumont, Wallingford.	35.00
			Daniel Morgan, Mystic.	35.00
			L L. Dimmock, Waterford.	36.00
			Joseph Roode, Griswold.	36.00
			T. C. Smith, Torrington.	40.00
			H. L. Vibberts, Manchester.	38.00
			D. B. Wilson, Waterbury.	36.00
			H. K. Brainard, Thompsonville.	38.00
			A. H. Anderson, Putnam.	36.00

SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3302	Ammoniated Wheat and Corn Phosphate.	Crocker Fertilizer Co., Buffalo, N.Y.	F. N. Barton, Watertown.	$35.00
			M. H. Aborn & Co., Rockville.	34.00
			J. E. Leonard, Jewett City.	32.00
			Henry Davis, Durham.	32.00
			W. C. Russell, Orange.	33.00
			J. E. Holmes, Ridgefield.	35.00
			Prindle & Clark, West Cheshire.	----
			Waldo Tillinghast, Plainfield.	33.00
			G. W. Clark, Milford.	----
			F. H. & F. W. Tillinghast, Central Village.	34.00
			H. L. Vibberts, Manchester.	35.00
			W. L. L. Spencer, Lebanon.	36.00
			E. W. Peck, Stratford.	36.00
3307	Potato Manure.	Quinnipiac Co., 7 Exchange Place, Boston, Mass.	D. N. Medbury, Pomfret.	36.00
			F. S. Bidwell, Windsor Locks.	36.00
			M. A. Covell, North Grosvernordale.	34.00
			A. J. Martin, Wallingford.	35.00
			C. E. Young, Killingly.	35.00
			C. A. Young, Danielsonville.	38.00
			G. M. Williams, New London.	35.00
			Olds & Whipple, Hartford.	40.00
			J. S. Worthington, Gildersleeve.	----
			D. C. Wood, Stratford.	38.00

Special Manures Sampled by the Station—*Continued.*

Station No.	Name or Brand.	Manufacturer.	Dealer.	Dealers' cash price per ton.
3242	Potato Manure.	Bradley Fertilizer Co., 27 Kilby St., Boston, Mass.	Warner, Taylor & Curtiss, Sandy Hook.	$36.00
			J. S. Wells, Hebron.	39.00
			G. W. Carver, Putnam.	34.00
			H. C. Aborn, Ellington.	36.00
			A. C. Sternberg, Hartford.	36.00
			F. S. Bidwell, Windsor Locks.	36.00
			D. W. Spencer, Centerbrook.	38.00
			D. N. Clark, Shelton.	40.00
			J. E. Leonard, Jewett City.	37.00
			Samuel Stevens, North Glastonbury.	----
			City Coal & Wood Co., New Britain.	37.00
			Strong & Tanner, Winsted.	36.00
			W. F. Andross, Hartford.	36.00
			T. F. Powers, Waterford.	35.00
			Dix & Welles, Wethersfield.	35.00
			J. E. Holmes, Stratford.	38.00
			D. N. Clark & Sons, Milford.	34.00
			R. A. Parker, Warehouse Point.	35.00
3276	Samson Fertilizer for Vegetables and Potatoes.	Read Fertilizer Co., Box 3121, New York.	Howard Ives, Cheshire.	40.00
3258	Complete Manure for Top Dressing Grass and Grain.	Bradley Fertilizer Co., Boston, Mass.	G. W. Grant, South Windsor.	40.00
3277	Great Eastern Fertilizer for Oats, Buckwheat and Seeding Down.	Great Eastern Fertilizer Co., Rutland, Vt.	W. A. Snow, Columbia.	35.00
			Way & Sanderson, Pomfret.	34.00
			J. E. Comstock, New London.	32.00

ANALYSES OF SPECIAL MANURES SAMPLED BY THE STATION.

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation.	Percentage Difference between Cost and Valuation.
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Available.		Found.	Guaranteed.				
												Found.	Guaranteed.						
3260	Fairchild's Formula for Corn and General Crops	3.70	----	1.91	5.61	*5.5*	----	----	----	12.28	*12.0*	----	----	13.46	*12.0*	11.75	$44.00	†44.80	*1.8
3322	Mapes' Manure for Seeding Down	.83	----	2.76	3.59	*2.5*	----	9.16	7.56	16.72	*18.0*	9.16	----	11.43	*10.0*	10.35	37.50	38.03	1.4
3314	Stockbridge Manure for Tobacco	----	3.57	3.47	6.90	*5.7*	----	5.37	3.97	9.34	*5.0*	5.37	*4.0*	11.66	*10.0*	.39	50.00	46.35	7.8
3287	Mapes' Grass and Grain Spring Top Dressing	.99	1.52	2.60	5.11	*4.1*	6.45	2.36	.58	9.39	*7.0*	8.81	*7.0*	6.14	*5.0*	5.12	39.00	36.17	7.8
3289	Mapes' Manure for Fruit and Vines	.45	.89	1.63	2.97	*1.7*	5.65	2.41	1.15	9.21	*7.0*	8.06	*7.0*	11.45	*10.0*	.64	38.00	35.20	7.9
3259	Rogers & Hubbard's Soluble Potato Manure	1.57	----	3.90	5.47	*5.0*	1.14	5.68	3.32	10.14	*10.0*	6.82	----	5.17	*5.0*	.58	37.00	33.84	9.3
3292	Mapes' Complete Manure for Light Soils	1.44	1.65	2.15	5.24	*4.9*	6.27	2.57	.64	9.48	*8.0*	8.84	*7.0*	7.11	*6.0*	6.26	42.00	37.51	11.9
3173	Leander Wilcox's Potato Manure	.67	.25	2.63	3.55	*3.2*	6.19	1.16	.11	7.46	*8.0*	7.35	*7.0*	5.97	*6.0*	1.71	33.00	28.83	14.4
3171	C. C. C. Special Potato Manure	.58	----	2.27	2.85	*2.7*	6.08	1.22	.75	8.05	----	7.30	*6.0*	11.03	*9.0*	14.14	35.00	30.51	14.7
3240	Bradley's High Grade Tobacco Manure	----	3.53	2.53	6.06	*5.8*	2.03	2.35	1.38	5.76	*4.0*	4.38	----	11.02	*10.8*	1.30	46.00	40.01	15.0
3261	Lister's Potato Fertilizer	1.03	.74	2.25	4.02	*3.7*	6.61	1.34	.52	8.47	----	7.95	*7.5*	6.99	*7.0*	4.43	37.00	32.01	15.6
3332	Reese's Concentrated Potato and Corn Manure	trace	----	3.17	3.17	*3.0*	4.28	4.13	.29	8.70	*7.0*	8.41	*6.0*	6.14	*7.5*	6.48	33.00	28.53	15.7
3239	Baker's Special Tobacco Manure	----	3.90	.87	4.77	*4.5*	3.41	1.13	.82	5.36	----	4.54	*4.0*	9.87	*10.0*	.76	41.00	35.27	16.2

* Valuation exceeds cost

† A mixture of bone flour and chemicals. Phosphoric acid valued as in bone of same fineness.

ANALYSES OF SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation.	Percentage Difference between Cost and Valuation.
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found.	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Available.		Found.	Guaranteed.				
												Found.	Guaranteed.						
3285	Mapes' Corn Manure	.84	.95	1.99	3.78	*3.7*	6.43	3.46	1.35	11.24	*10.0*	9.89	*8.0*	6.62	*6.0*	6.15	$40.00	$34.10	17.3
3236	Mapes' Corn Manure	.99	1.06	1.86	3.91	*3.7*	6.27	3.49	1.41	11.17	*10.0*	9.76	*8.0*	6.30	*6.0*	5.80	40.00	34.06	17.5
3290	Mapes' Tobacco Manure, Conn. Brand	.60	1.65	2.49	4.74	*4.7*	5.23	2.95	.67	8.85	....	8.18	*7.8*	8.08	*7.7*	1.00	44.00	37.28	18.0
3243	Bradley's Complete Manure for Potatoes and Vegetables	.33	1.23	2.20	3.76	*3.7*	7.01	1.90	1.45	10.36	*9.0*	8.91	*8.0*	5.36	*6.0*	5.95	38.00	31.78	19.5
3238	Baker's Potato Manure	.41	2.63	.88	3.92	*3.3*	4.91	1.62	.89	7.42	....	6.53	*5.0*	10.73	*10.0*	4.40	42.50	34.93	21.7
3286	Mapes' Tobacco Manure, Wrapper Brand	1.13	3.45	1.47	6.05	*6.2*	.72	3.96	1.75	6.43	*4.5*	4.68	*4.5*	10.36	*10.5*	1.31	48.00	39.44	21.7
3293	Mapes' Potato Manure	.89	.87	2.24	4.00	*3.3*	5.52	2.79	1.28	9.59	*8.0*	8.31	*8.0*	7.45	*6.0*	.54	42.00	34.32	22.4
3313	Darling's Potato and Root Crop Manure	.41	.34	3.16	3.81	*2.9*	2.85	4.80	2.78	10.43	....	7.65	*10.0*	6.46	*7.0*	5.25	38.00	30.93	22.9
3327	Williams & Clark's High Grade Special for Potatoes, Tobacco, Onions and Cabbage	.46	.85	2.30	3.61	*3.7*	5.60	3.35	1.92	10.87	*8.0*	8.95	*7.0*	6.63	*7.0*	6.79	40.00	32.34	23.7
3279	Great Eastern Vegetable, Vine and Tobacco Fertilizer	.17	....	2.08	2.25	*2.1*	6.40	1.97	1.16	9.53	*9.0*	8.37	*8.0*	6.29	*6.0*	6.00	34.00	26.26	29.4
3315	Bowker's Stockbridge Manure for Corn	1.37	....	1.95	3.32	*3.3*	7.52	2.49	1.50	11.51	*9.0*	10.01	*8.0*	4.31	*7.0*	4.03	40.00	30.27	32.1
3300	Crocker's Special Potato Manure	....	.19	3.27	3.46	*3.7*	6.59	1.16	1.14	8.89	*9.0*	7.75	*8.0*	6.47	*5.5*	6.16	39.00	29.40	32.7
3278	Great Eastern Grain and Grass Fertilizer	.23	....	2.78	3.01	*2.9*	6.88	1.78	.74	9.40	*9.0*	8.66	*8.0*	2.22	*2.0*	3.32	34.00	25.57	32.9

ANALYSES OF SPECIAL MANURES SAMPLED BY THE STATION—*Continued.*

Station No.	Name or Brand.	Nitrogen.					Phosphoric Acid.							Potash.		Chlorine.	Cost per Ton.	Valuation.	Percentage Difference between Cost and Valuation.
		Nitrogen as Nitrates.	Nitrogen as Ammonia.	Nitrogen, Organic.	Total Nitrogen Found,	Nitrogen Guaranteed.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Guaranteed.	Available. Found.	Available. Guaranteed.	Found.	Guaranteed.				
3244	Bradley's Complete Manure for Corn and Grain	.23	.49	2.35	3.07	*2.9*	7.65	2.71	1.03	11.39	*9.0*	10.36	*8.0*	3.71	*3.0*	3.93	$40.00	$29.83	34.1
3316	Stockbridge Manure for Potatoes and Vegetables	1.97	....	1.80	3.77	*3.3*	4.61	2.17	2.75	9.53	*8.0*	6.78	*7.0*	6.99	*5.0*	5.19	40.00	29.34	36.3
3298	Crocker's Potatoes, Tobacco and Hop Phosphate	....	....	2.25	2.25	*2.0*	6.80	2.93	1.87	11.60	*11.0*	9.73	*10.0*	3.41	*3.5*	3.80	36.00	26.08	38.0
3305	Stewart's Soluble Pacific Potato Fertilizer	....	....	2.82	2.82	*2.5*	4.75	2.35	1.92	9.02	*7.0*	7.10	*5.0*	5.23	*5.0*	4.92	35.00	25.35	38.0
3357	Acme Fertilizer Co's Conn. Brand for Potatoes	....	1.52	1.41	2.93	*3.3*	4.19	1.83	2.59	8.61	*7.0*	6.02	....	7.80	*7.0*	7.15	38.00	27.50	38.1
3326	Williams & Clark Fertilizer Co's Potato Phosphate	trace	....	2.87	2.87	*2.5*	5.23	2.48	1.12	8.83	*7.0*	7.71	*6.0*	5.02	*5.0*	3.81	36.00	25.96	38.7
3302	Crocker Ammoniated Wheat and Corn Phosphate	.05	....	2.10	2.15	*2.0*	7.15	2.81	1.92	11.88	*11.0*	9.96	*10.0*	1.54	*1.7*	2.45	34.00	24.48	38.9
3307	Quinnipiac Potato Manure	....	....	2.84	2.84	*2.5*	4.85	2.51	1.28	8.64	*7.0*	7.36	*6.0*	5.27	*5.0*	4.33	36.00	25.68	40.7
3242	Bradley's Potato Manure	.20	....	2.62	2.82	*2.5*	4.74	2.50	1.72	8.96	*8.0*	7.24	*6.0*	4.94	*5.0*	4.82	36.00	25.17	43.0
3276	Read's Samson Fertilizer for Vegetables and Potatoes	....	....	2.25	2.25	*2.5*	7.09	1.70	.67	9.46	*9.0*	8.79	*8.0*	6.84	*5.0*	6.28	40.00	27.30	46.5
3258	Bradley's Complete Manure for Top Dressing Grass and Grain	5.08	....	....	5.08	*5.0*	2.69	2.36	1.42	6.47	*6.0*	5.05	*5.0*	3.03	*2.5*	.40	40.00	26.37	51.6
3277	Great Eastern Fertilizer for Oats, Buckwheat and Seeding Down	trace	....	1.15	1.15	*.8*	7.20	1.44	.65	9.29	*9.0*	8.64	*8.0*	4.34	*4.0*	5.78	33.00	21.42	54.1

E. F. Coe's Potato Manure.

Below, No. **3231**, is given an analysis of this brand made on a mixture of equal parts of six samples drawn by our agents from stock of the following dealers: I. W. Denison, Mystic; W. C. Reynolds, Goodspeeds; H. L. Vibberts, Manchester; J. Amidon, Wethersfield; J. O. Fox & Co., Putnam; D. G. Penfield, Danbury.

The manufacturer objected that this analysis did not represent the quality of the goods shipped into Connecticut, and for this reason the analysis is here specially noted and not tabulated with the others. The sample is well above the manufacturer's guarantee in nitrogen and phosphoric acid but below in potash. The manufacturer claimed that it should show 6 per cent. actual potash, and believed that the sample might have been drawn by mistake from some other brand. It is inconceivable that the same mistake should have been made in six different places, but in order to see if the samples taken from the different dealers were nearly alike, nitrogen determinations were made separately in the six different samples.

The results in per cents. were as follows: 3.05, 2.05, 2.42, 2.18, 1.52, 2.05. A new mixture was now made, excluding the sample which had the lowest per cent. of nitrogen, 1.52, and analyzed with the results given under **3231A.**

	3231	3231A
Nitrogen in ammonia	.68	.74
Nitrogen, organic	1.58	1.70
Total nitrogen	2.26	2.44
Soluble phosphoric acid	6.75	6.40
Reverted " "	2.76	2.79
Insoluble " "	1.69	2.20
Total " "	11.20	11.39
Potash	4.09	3.80
Chlorine	1.38	.96

IV. Home Mixed Fertilizers.

Many farmers prefer to buy fertilizer-chemicals and mix them according to their own ideas of the requirements of their land and crops, and with the conviction that in the present state of the fertilizer trade they can buy nitrogen, phosphoric acid and potash more economically in this way than in any other.

The formulas of such home-mixtures as have been received at the Station and also the analyses are given in the tables on pages 76 to 80.

Since, in most cases, the stocks from which the chemicals were bought have been sampled and analyzed by the Station it is easy to calculate what the composition of the mixtures would have been if the goods had been perfectly uniform and the weighing and mixing accurate and thorough, without loss or gain of moisture.

This *calculated* composition is likewise given in the table.

The cost of the materials, *unmixed*, delivered at the purchaser's freight station is also given so far as could be ascertained.

The regular cash retail price of the materials is stated in nearly every case. Special and considerably reduced rates were obtained in a number of cases.

The valuations were calculated as in the preceding tables.

CALCULATED AND ACTUAL COMPOSITION.

The calculated nitrogen in most cases agrees fairly well with the amount actually found. There are greater discrepancies in phosphoric acid and potash ; in most cases the actual phosphoric acid is less than calculated, and the potash more than calculated.

AVERAGE COMPOSITION OF HOME MIXTURES.

	Highest.	Lowest.	Average.
Nitrogen as nitrate	2.95	none.	.82
" " ammonia	1.97	none.	.65
" organic	4.85	1.61	2.78
Total nitrogen	6.51	3.23	4.25
Soluble phosphoric acid	10.25	.16	4.72
Reverted " "	6.33	1.53	3.83
Insoluble " "	5.11	.55	2.53
Total " "	15.11	6.09	11.08
Potash	15.85	2.08	6.57
Cost of materials per ton unmixed	$39.60	$26.43	$34.82
Valuation per ton	$38.27	$30.28	$34.57

In the above table only those mixtures are regarded whose formulas are known.

Comparing the Home Mixtures with the Special Manures it is seen that the former contain on the average (fourteen analyses) half of a per cent. more nitrogen, over one and a half per cent. more phosphoric acid and slightly more of potash than the latter.

COST, VALUATION AND PERCENTAGE DIFFERENCE.

The average cost of the materials of which these mixtures were made, delivered, without the special discounts which were obtained in some cases, was $34.47. To this must be added the cost of screening and mixing which is necessarily variable and is estimated by those who have had experience, at from one to two dollars per ton.

If the average cost of the *mixed* materials is placed at $37.00 per ton it will probably fully cover all expense in every case.

On this basis

the average cost of the Home Mixtures has been $37.00, the average valuation $34.47 and the percentage difference 7.3.

FORMULAS OF THE HOME MIXTURES.

3125. Mixture made by S. E. Curtiss, Stratford.

FORMULA.

3,200	pounds	Dissolved Bone Black, costing	$41.60
600	"	Double Sulphate of Potash, "	9.00
600	"	Muriate of Potash, "	12.75
800	"	Nitrate of Soda, "	20.00
2,800	"	Tankage, "	49.00
8,000			$132.35

3153. Mixture for general use made by N. D. Platt, Milford.

FORMULA.

1,335	pounds	Tankage, costing	$24.03
1,333	"	Dissolved Bone Black, "	17.32
333	"	Bone, "	5.32
333	"	Sulphate of Ammonia, "	11.98
333	"	Double Sulphate of Potash, "	5.00
333	"	Muriate of Potash, "	7.09
4,000			$70.74

Cost of materials $36.37 per ton delivered at Milford.

3154. Mixture for Potatoes made by Geo. F. Platt, Milford.

FORMULA.

800	pounds Tankage,	costing	$14.40
400	" Bone,	"	6.40
550	" Dissolved Bone Black,	"	7.15
50	" Sulphate of Ammonia,	"	1.80
100	" Nitrate of Soda,	"	2.50
50	" Double Sulphate of Potash,	"	.75
50	" Muriate of Potash,	"	1.07
2,000			$34.07

Cost of materials $35.07 delivered at Milford.

3155. Mixture for Potatoes made by R. M. Treat, Woodmont.

FORMULA.

450	pounds Tankage,	costing	$ 8.10
170	" Sulphate of Ammonia,	"	6.12
1,000	" Dissolved Bone Black,	"	13.00
280	" Muriate of Potash,	"	5.96
100	" Double Sulphate of Potash,	"	1.50
2,000			$34.68

Cost of materials $35.68 delivered at Woodmont.

3156. Mixture for Potatoes, made by Dennis Fenn, Milford.

FORMULA.

350	pounds Muriate of Potash,	costing	$ 7.45
900	" Dissolved Bone Black,	"	11.70
1,400	" Tankage,	"	25.20
350	" Nitrate of Soda,	"	8.80
3,000			$53.15

Materials cost $36.43 delivered at Milford.

3160. Mixture for general use made by W. L. and S. T. Merwin, Milford.

FORMULA.

700	pounds Muriate of Potash,	costing	$14.91
3,400	" Dissolved Bone Black,	"	44.20
500	" Tankage,	"	9.00
700	" Sulphate of Ammonia,	"	2.52
500	" Bone,	"	8.00
2,200	" Fish containing some potash,	"	24.20
8,000			$102.83

Materials cost $26.43 delivered at Milford.

3188. Mixture for Oats, made by T. J. Stroud, Shaker Station.

FORMULA.

800	pounds	Tankage.
700	"	Castor Pomace.
400	"	Nitrate of Soda.
200	"	Muriate of Potash.
100	"	Dissolved Bone Black.
100	"	Plaster.
2,300		

3189. Mixture for Potatoes, made by T. J. Stroud, Shaker Station.

FORMULA.

700	pounds	Tankage.
500	"	Castor Pomace.
50	"	Nitrate of Soda.
400	"	Muriate of Potash.
250	"	Double Sulphate of Potash.
100	"	Dissolved Bone Black.
100	"	Plaster.
2,100		

3191. Made by Dennis Fenn, Milford. It contains tankage, dissolved bone black, nitrate of soda and ashes. Exact proportions not known.

3205. Mixture made by H. S. Frye, Poquonock.

FORMULA.

4,000	pounds	Cotton Seed Meal,	costing	$49.00
1,200	"	Dissolved Bone Black,	"	15.60
900	"	Double Sulphate of Potash,	"	13.50
300	"	Sulphate of Ammonia,	"	10.80
1,600	"	Tankage,	"	28.80
8,000				$117.70

Materials cost $29.42 per ton delivered at Windsor.

3207. Mixture for Tobacco, made by A. E. Holcomb, Poquonock.

FORMULA.

150	pounds	Sulphate of Ammonia,	costing	$ 5.40
800	"	Tankage,	"	14.40
600	"	Dissolved Bone Black,	"	7.80
450	"	Double Sulphate of Potash,	"	6.75
2,000				$34.35

Materials cost $36.15 per ton delivered at Poquonock.

3226. Mixture for Corn, made by Dennis Fenn, Milford.

FORMULA.

500 pounds Bone,	costing	$ 8.00
200 " Muriate of Potash,	"	4.26
600 " Dissolved Bone Black,	"	7.80
500 " Tankage,	"	9.00
200 " Nitrate of Soda,	"	5.00
2,000		$34.06

Materials cost $35.06 per ton delivered at Milford.

3267 and **3268.** Mixtures made by J. M. Brown, Poquonock, formulas not given.

3273. Mixture for Corn, made by T. J. Stroud, Shaker Station.

FORMULA.

800 pounds	Castor Pomace.
900 "	Tankage.
200 "	Muriate of Potash.
100 "	Dissolved Bone Black.
100 "	Nitrate of Soda.
100 "	Plaster.
2,200	

3281. Mixture made by E. J. Wells, East Windsor Hill.

FORMULA.

150 pounds	Sulphate of Ammonia.
700 "	Dissolved Bone Black.
700 "	Tankage.
245 "	High Grade Sulphate of Potash.
1,795	

Materials cost $34.50 delivered at East Windsor Hill.

3282. Mixture made by E. J. Wells, East Windsor Hill.

FORMULA.

262 pounds	Muriate of Potash.
800 "	Dissolved Bone Black.
700 "	Tankage.
266 "	Nitrate of Soda.
2,028	

Materials cost $31.50 per ton delivered at East Windsor Hill.

3283 and **3284.** Mixtures for general use made by H. G. Osborne, East Windsor Hill.

HOME MIXED FERTILIZERS.—ANALYSES AND VALUATIONS.

Station No.	Name.	Nitrogen.					Phosphoric Acid.					Potash.		Chlorine.	Valuation per Ton.	Cost of Raw Material per Ton, Delivered.
		As Nitrates.	As Ammonia.	Organic.	Total Found.	Total Calculated.	Soluble.	Reverted.	Insoluble.	Total Found.	Total Calculated.	Found.	Calculated.			
3125	S. E. Curtiss, Home Mixture	1.75	----	1.85	3.60	*3.9*	6.40	2.32	1.32	10.04	*10.9*	5.84	*5.7*	3.79	$30.48	$34.09
3153	N. D. Platt, Mixture for General Use	----	1.64	2.32	3.96	*3.9*	7.02	3.16	2.34	12.52	*13.9*	6.35	*6.3*	4.05	36.06	36.37
3154	G. F. Platt, Mixture for Potatoes	.74	.60	3.22	4.56	*4.3*	5.39	4.61	5.11	15.11	*17.3*	2.08	*1.9*	.41	34.11	35.07
3155	R. M. Treat, Mixture for Potatoes	----	1.60	1.63	3.23	*3.0*	10.25	1.53	.56	12.34	*12.5*	6.53	*8.4*	6.14	35.77	35.68
3156	Dennis Fenn, Mixture for Potatoes	1.71	----	3.06	4.77	*4.5*	5.79	3.29	2.68	11.76	*13.9*	5.79	*5.9*	5.46	34.91	36.43
3160	W. L. & S. T. Merwin, Home Mixture	----	1.97	1.61	3.58	*3.6*	7.95	1.77	.55	10.27	*10.7*	5.42	*5.1*	5.19	32.76	26.43
3188	T. J. Stroud, Mixture for Oats	2.95	----	3.56	6.51	*6.2*	.86	3.84	2.04	6.74	*7.9*	6.08	*4.7*	----	33.02	----
3189	T. J. Stroud, Mixture for Potatoes	.32	----	3.00	3.32	*3.4*	.83	3.49	1.77	6.09	*7.6*	15.85	*13.1*	9.70	32.38	----
3191	Dennis Fenn, Mixture for Potatoes	.94	----	2.36	3.30	----	1.31	3.51	5.07	9.89	----	6.36	----	.54	26.30	----
3205	H. S. Frye, Home Mixture	----	.74	4.85	5.59	*5.4*	2.40	3.01	2.13	7.54	*7.8*	6.82	*4.0*	2.37	33.84	29.42
3207	A. E. Holcomb, Home Mixture	----	1.06	2.20	3.26	*3.6*	5.81	4.17	2.75	12.73	*13.2*	5.90	*5.6*	----	33.89	36.15
3226	Dennis Fenn, Home Mixture	1.45	----	2.78	4.23	*3.9*	5.60	4.72	4.14	14.46	*15.8*	5.32	*5.2*	4.23	35.32	35.06
3267	J. M. Brown, Home Mixture	----	2.69	2.32	5.01	----	5.66	6.34	2.47	14.47	----	3.10	----	.32	40.03	35.00
3268	J. M. Brown, Home Mixture	----	.34	1.92	2.26	----	4.34	5.53	2.22	12.09	----	17.22	----	.68	42.10	35.00
3273	T. J. Stroud, Mixture for Corn	.97	----	4.35	5.32	*4.9*	.16	5.32	1.88	7.36	*9.2*	5.54	*5.0*	5.21	30.28	----
3281	E. J. Wells, Home Mixture	----	1.55	2.41	3.96	*3.9*	4.16	6.33	4.03	14.52	*13.5*	6.76	*6.8*	.54	38.27	34.50
3282	E. J. Wells, Home Mixture	1.63	----	2.14	3.77	*4.1*	3.57	6.12	4.21	13.90	*12.7*	7.67	*6.7*	6.79	34.84	31.50
3283	H. G. Osborne, Home Mixture	----	1.20	1.71	2.91	----	5.02	3.83	1.92	10.77	----	11.01	----	.93	36.15	----
3284	H. G. Osborne, Home Mixture	.99	----	2.28	3.27	----	6.83	3.38	.69	10.90	----	8.70	----	5.19	34.41	----

Miscellaneous Fertilizers and Manures.

Cotton-Hull Ashes.

The analyses of 33 samples of this material are tabulated on page 82.

Samples numbered **3098** and **3104** represent the same stock. The analysis of the first sample being unsatisfactory, showing less potash than was guaranteed, and the amount of ashes represented being very considerable, a second sample, No. **3104,** was drawn by a Station agent which showed a much higher per cent. of potash than the first sample.

By reference to the last column of the tables it is seen that actual potash in these samples has cost from 3.2 cents to 8.9 cents per pound.

The ashes selling for $40.00 per ton, we are informed, are screened ashes, free from the large lumps which the cheaper ashes contain. The analyses show that these ashes selling at the higher price have contained on the average more potash than the " cheaper " ashes and the potash in them has cost less per pound; 4.3 cents on the average as against 4.7 cents.

The highest per cent. of water-soluble potash found in any of these samples is 35.23, the lowest 15.50 and the average percentage 25.41.

Canada Unleached Wood Ashes.

All the analyses of Canada ashes made during the year are tabulated on page 86. The first two analyses, Nos. **3361** and **3379,** were made on samples drawn by a Station agent experienced in the work. The other samples were drawn by dealers or consumers. As the following data show, some of them certainly did not at all represent the goods whose value they were intended to fix, but the analyses are published to emphasize the need of great care in drawing and bottling the samples and of sending us full particulars regarding them.

No. **3361,** sampled by a Station agent, was guaranteed to contain 5½ per cent. potash and 1½ per cent. phosphoric acid. When the dealer was informed of the result of the analysis he promptly remitted to the purchaser a sum sufficient to fully cover the discrepancy between the guaranteed and actual composition. Subsequent investigation by the dealer convinced him that the poor

ANALYSES OF COTTON HULL ASHES.

Station No.	Dealer or Purchaser.	Sampled by	Soluble Phosphoric Acid.	"Reverted" Phosphoric Acid.	Insoluble Phosphoric Acid.	Potash Soluble in Water.	Cost per ton.	Valuation per ton.	Potash costs† per pound in cents.
3097	H. K. Brainard, Thompsonville.	Arthur Sikes, Suffield.	2.45	5.83	1.35	24.70	$33.00	$40.38*	4.0
3098	R. E. Pinney, Suffield.	W. H. Prout, Suffield.	.16	6.81	.19	28.57	40.00	41.98*	5.1
3099	W. W. Cooper, Suffield.	O. C. Rose, W. Suffield.	.64	6 34	1.23	22.30	35.00	35.55*	5.4
3102	J. E. Soper & Co., Boston, Mass.	A. E. Holcomb, Poquonock.	1.60	5.50	2.20	17.44	30.00	30.87*	5.2
3104	R. E. Pinney, Suffield.	Station Agent.	.18	7.49	.22	35.23	40.00	48.15*	4.2
3109	From Texas Oil Mills.	S. L. Smith, Poquonock.	.46	4.36	1.36	21.42	28.00	31.38*	4.7
3111	I. L. Spencer, Suffield.	J. A. Hemenway, Suffield.	.64	7.38	3.26	23.00	32.00	38.69*	4.0
3114	I. L. Spencer, Suffield.	Robert Obram, Thompsonville.	.67	7.47	2.17	22.70	32.00	38.11*	4.1
3121	National Oil Co., Galveston, Texas.	Alfred Spencer, Suffield.	1.02	6.73	1.21	24.64	28.00	39.31	3.2
3123	Unknown.	B. F. Case, Canton Center.	.83	5.48	2.03	21.15	34.00	33.63	5.5
3144	Edward Austin, Suffield.	Frederick Clark, Suffield.	.83	5.93	1.30	26.98	33.00	40.43	4.1
3151	R. A. Parker, Warehouse Point.	Station Agent.	1.92	7.49	.75	31.26	40.00	48.99	4.0
3152	Olds & Whipple, Hartford.	A. H. Clark, Poquonock.	2.94	7.21	.71	30.98	40.00	49.86	3.9
3157	R. E. Pinney, Suffield.	C. H. Wells, Suffield.	1.97	9.44	.94	28.42	40.00	48.95	3.9
3158	Olds & Whipple, Hartford.	L. L. Bedortha, Windsor.	.58	7.35	.35	29.72	40.00	44.78	4.7
3159	Olds & Whipple, Hartford.	L. L. Bedortha, Windsor.	2.37	9.21	1.60	29.00	40.00	50.14	3.7
3161	Olds & Whipple, Hartford.	A. A. Viets, Bloomfield.	1.12	8.40	3.82	16.66	35.00	34.24	5.8
3165	R. E. Pinney, Suffield.	C. H. Wells, Suffield.	1.71	8.71	.52	30.22	40.00	49.26	3.9
3166	R. E. Pinney, Suffield.	C. H. Wells, Suffield.	1.73	8.88	.84	28.82	40.00	48.13	4.1
3168	James Van Gelder, W. Suffield.	F. C. Root, Suffield.	.69	7.26	1.52	22.55	----	37.40	--
3201	R. E. Pinney, Suffield.	D. L. Brockett, Suffield.	2.91	7.01	2.72	27.34	----	46.33	--
3203	F. W. Muck, Agent.	H. S. Frye, Poquonock.	1.92	5.64	1.11	8.56	----	21.39	--
3204	F. W. Muck, Agent.	H. S. Frye, Poquonock.	.06	6.12	.57	29.10	----	41.50	--
3210	R. E. Pinney, Suffield.	H. H. Austin, Suffield.	1.47	7.46	.64	30.40	40.00	47.24	4.3
3211	R. E. Pinney, Suffield.	H. H. Austin, Suffield.	1.82	8.93	1.06	27.17	40.00	46.62	4.2
3225	T. Soule & Co., New Milford.	E. A. Wildman, New Milford.	1.04	6.23	2.26	25.12	35.00	39.53	4.6
3249	Edwin Copley, W. Suffield, bought of W. F. Fletcher, Southwick, Mass	F. C. Root, Suffield.	.38	6.89	2.04	18.99	35.00	32.65	6.1
3250	H. N. Loomis, W. Suffield.	F. C. Root, Suffield.	2.45	7.05	2.10	27.58	40.00	45.68	4.5
3252	F. W. Rising, W. Suffield.	F. C. Root, Suffield.	1.79	8.11	2.38	26.18	40.00	44.78	4 6
3270	F. W. Culver, W. Suffield.	F. C. Root, Suffield.	1.07	8.65	2.15	24.72	40.00	42.74	4 9
3294	H. M. Rose, W. Suffield.	F. C. Root, Suffield.	2.00	8.25	2.75	25.98	40.00	45.26	4.5
3295	C. L. Austin, W. Suffield.	F. C. Root, Suffield.	2.30	7.03	2.38	26.48	40.00	44.31	4.7
3364	H. K. Brainard, Thompsonville, from American Oil Co.	R. C. Gaines, Thompsonville.	trace.	3.30	1.13	15.50	33.00	22.45	8.9

* These figures based on the schedule of valuation for 1891, differ from those originally reported before the new schedule was adopted.

† Allowing 8, 7½ and 2 cents per pound respectively for soluble, reverted and insoluble phosphoric acid as in superphosphates.

quality of the ashes was due to their being put in hired storage, before shipment, which storage did not fully protect them from wetting.

The two samples, **3362** and **3378**, are instructive, as it is alleged that both were taken from the same lot. No. **3362** was sent with a letter from which it was fairly inferred that a number of purchasers had joined in a purchase and in drawing and sending the sample. After the analysis was reported and inquiry made the purchaser wrote, "It was drawn by the dealer and some other gentlemen who assured me that it was a fair sample of the cargo [boat load]. I did not see the drawing. I have ten tons of the same ashes and will very carefully take a sample."

Regarding the second sample, **3378**, he writes, "I send you a carefully drawn sample of those ashes. I got it by digging three holes in different sides of the pile not too near the bottom and taking out of each and mixing thoroughly together." The second sample was taken sometime after the first one. In the meantime the ashes had lain in a pile on the ground but the purchaser thinks had not been rained on.

It will be seen that the first sample drawn by the dealer contained 11.14 per cent. of water-soluble potash. The second sample, drawn by the purchaser, contained 5.01 per cent. of potash, less than half as much.

The purchaser of the sample **3360**, wrote when sending it, "The car load was purchased by me from Canada, price $12.00 per ton delivered here. I think them very fine if they show up as well as they look." Later, after the analysis was made, he wrote replying to inquiry: "I had ordered a car of ashes from Canada and requested the dealer to send me a sample of them by mail when loaded. I used what I wished to" (of the sample) "then sent them to you. On receiving your report I wrote to the seller who states that he was not there when the car was loaded and he thinks *his man sent me that sample from another lot* of ashes made entirely from elm wood!"

It should not need to be said that a sample drawn at random by the hired man of a dealer in Canada has little worth in fixing the value of a car load of ashes delivered here in Connecticut.

When the car load arrived the purchaser drew a sample himself and sent it to the Station properly authenticated. This is No. **3368** in the table. The sample drawn in Canada by the dealer's "man" showed 14.49 per cent. of potash, the one drawn from the goods delivered showed 4.10 per cent.—less than one-third as much.

Samples **3367** and **3384**, representing a lot originally consisting of 15½ tons, were sent from Darien, Ct. The analysis of **3367** was so unsatisfactory to the seller living in Ontario, Canada—he having guaranteed 5 per cent. or over of potash—that he desired another analysis from a fresh sample. This is stated to have been drawn from the remaining ashes in the manner requested by him, from the center of the parcel. A noticeable difference between the two samples is the 8.4 per cent. less moisture contained in the latter. **3367** was sent to the Station, Sept. 10th, and **3384** Oct. 16th. Both were sent in small paper boxes and loss or gain of moisture may have easily occurred.

When the analyses are recalculated, after deducting the variable moisture, we have in the *dry ashes* the following percentages :

	3367.	**3384.**
Potash, soluble in water	3.54	4.03
Phosphoric acid	1.18	1.55
Carbonate of lime	73.98	77.66
Sand and silica	9.06	10.34

A more complete analysis of **3384** serves to show the amounts of the other ingredients in these ashes.

Potash, soluble in water	4.00
Soda, " "	.50
Lime, soluble in hydrochloric acid	42.74
Magnesia " " "	4.03
Sulphuric acid, soluble in hydrochloric acid	.82
Phosphoric acid, " " "	1.53
Carbonic acid	24.49
Sand and silica, insoluble in acid	10.17
Charcoal	2.09
Moisture	1.73
Alumina, oxides of iron, and manganese, and undetermined matters of no fertilizing value	7.90
	100.00

In view of the experience of the past season, the Station declines to analyze, at public expense, any samples of wood or cotton hull ashes which are not drawn in accordance with its directions and *fully* described on a blank form which will be sent to any one in the State on application.

SUBSTITUTES FOR UNLEACHED ASHES.

Very considerable quantities of ashes are annually brought into the State from Canada. There is no way of learning the total quantity, but we are informed that in Westport, Southport and near-lying towns alone about 800 tons have been sold the last season. In view of the fact that the quality of the "Canada ashes" sold in Connecticut has deteriorated of late it is worth considering whether a substitute as serviceable and considerably cheaper may not be found. A ton of unleached Canada ashes of good quality contains:

Sand, earth and coal	260	pounds.
Water	240	"
Oxide of iron, alumina, carbonate of soda, etc.	131	"
Actual potash	110	"
Phosphoric acid	39	"
Carbonate with some hydrate of lime and magnesia	1220	"
	2000	

The agricultural value of ashes consists largely in the finely divided carbonate of lime which they contain, which is of great account in many cases as an amendment and in promoting the processes of decay and nitrification within the soil.

It is safe to say that the carbonates and phosphates of potash, magnesia and lime constitute the entire agricultural value of ashes. Can we then provide 110 pounds of potash, 39 of phosphoric acid and 1220 of carbonate of lime in fine condition in some other form cheaper than ashes?

An application in the late fall of 20 bushels of burned oyster shell lime (40 pounds to the bushel), at 12 cents per bushel would supply as much lime as a ton of ashes at a cost $2.40, 500 pounds of cotton hull ashes in addition would cost $8.75 and supply as much or more potash than a ton of Canada ashes and very considerably more phosphoric acid. The weight of these two things would be 1300 pounds as against 2000 pounds of Canada ashes which involves a saving in cartage—the cost $11.15, a little less than Canada ashes cost on the average.

The comparison is here made with ashes of excellent quality. With ashes of lower grade which are more common in our markets to-day, the showing for the substitute would be much more favorable.

Or if cotton hull ashes are not available, for them may be used 220 pounds of high grade sulphate of potash and 150 pounds of

ANALYSES OF UNLEACHED CANADA ASHES.

	3361	**3362**	**3378**	**3360**	**3368**	**3385**	**3396**	**3397**	**3380**	**3395**	**3379**	**3367**	**3384**
Potash, soluble in water	2.92	11.14	5.01	14.49	4.10	3.93	4.74	4.42	7.17	8.75	4.65	3.19	4.00
Phosphoric acid	1.28	1.27	1.50	1.13	1.44	1.22	1.42	1.34	1.34	.96	1.48	1.06	1.53
Carbonate of lime*	56.40	----	50.60	63.20	57.50	46.90	53.60	45.80	56.10	59.60	57.20	66.50	76.32
Sand and silica	13.97	6.39	12.83	6.08	10.80	24.20	20.24	27.08	14.75	19.33	10.65	8.15	10.17
Water, expelled at 212°	15.92	----	17.80	9.00	16.00	11.40	4.45	7.35	6.42	3.45	15.05	10.12	1.73
Cost per ton	$12.00	10.00	10.00	12.00	12.00	10.50	12.00	10.50	12.00	15.00			

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* Equivalent to the total calcium oxide (CaO) found soluble in hydrochloric acid.

some cheap steamed bone like Peter Cooper's Bone, and 800 pounds of oyster shell lime, the three costing $11.10.

The above named mixtures would be close imitations of superior wood ashes not only as respects the kinds and proportions of fertilizing elements, but also as to the forms or combinations of those elements. Still cheaper and in most cases probably no less effective, would be a mixture of 800 pounds (20 bushels) of burned oyster shell lime with 150 pounds of Peter Cooper's Bone and 220 pounds of muriate of potash—the total weighing 1170 pounds and costing $9.45.

The oyster shell lime being caustic should be put on in the late fall or early spring and being fine and pulverulent it will soon be converted into carbonate.

Stone lime could be used instead of oyster shell lime but being in hard lumps would require slacking before being sown. The sulphate or muriate of potash and bone are best applied in spring.

It is hoped that our farmers may make thorough trial of these substitutes which are considerably cheaper than the average of Canada ashes, quality as well as price being taken account of.

ASHES FROM HOUSEHOLD FIRES IN CONNECTICUT AND FROM FACTORIES.

3399. Sample of ashes gathered from house to house in Torrington.

3400. Sample of ashes gathered from a single house. Both of the above sent by H. Von Tobel, Harwinton.

3402. Ashes from The Coe Co. Brass Works, Torrington. Sampled and sent by the Echo Farm Co.

ANALYSES.

	3399	3400	3402
Potash	5.53	4.11	2.83
Phosphoric acid	3.18	4.00	2.18
Cost per bushel	18 cents.		12 cents.

LIME KILN ASHES.

3398. Sent by D. C. Spencer, Saybrook.

3403 and **3404** sent by S. A. Eddy, Canaan, from the Canaan Lime Co.; **3403** was from a pile which had been exposed to the weather for some time; **3404** was from a pile on which fresh ashes were being dumped.

ANALYSES.

	3398	3403	3404
Potash	.33	.44	.41
Phosphoric acid	.10	----	----
Lime	62.05	26.87	30.66
Insoluble in acid	----	2.41	1.54
Moisture	----	29.54	18.16

These "ashes" contain about a tenth of one per cent. of phosphoric acid and less than a half of one per cent. of potash. They will be useful as a cheap form of lime for "liming" land where that is desirable.

RAG DUST.

3374. A sample of the dust from Egyptian rags, which is one of the wastes from the Windsor Locks paper mill, was sent to the Station by R. E. Pinney, Suffield. It contains .96 per cent. of ammonia and only traces of phosphoric acid, but is said to have greatly increased the crops on land to which it was applied very liberally. Its action on the soil must be largely mechanical.

HEN MANURE.

3145. A sample of "fresh hen manure" from stock of E. M. Spalding, Suffield. Sampled by J. S. Gardner, Suffield.

ANALYSIS.

Moisture	34.87
Organic and volatile matter	20.28
Ash	44.85
	100.00
The organic matter contains: Nitrogen	.56
The ash contains: Sand and earth	9.41
Phosphoric acid	.35
Potash	.36

BEEF SCRAP.

3146. Sampled and sent by E. N. Spalding, Suffield. This consisted of lumps of dried meat and raw bones. It contained 7.44 per cent. of nitrogen and 5.14 per cent. of phosphoric acid. It also contained 11.07 per cent. of moisture and 23.14 per cent. of grease.

The material could probably be best used in the compost heap. At the price charged, $1.75 per hundred or $35.00 per ton, it would be poor economy to buy it for a fertilizer.

MUCK.

3223. A sample sent by G. H. Bartlett of North Guilford, who writes regarding it: "The sample is from a swamp of twenty-five acres. Bottom is a very hard gravel—looks like drift. Thickness of muck 5 to 10 feet. This sample came from where it was five feet deep. The first two feet were rejected because contaminated with leaves, sticks, etc. The sample therefore represents the layer between the second and fifth foot."

ANALYSIS.

	As received.	Water-free.
Water	87.22	----
Organic and volatile matters	11.66	91.23
Ash	1.12	8.77
	100.00	100.00
Nitrogen	.31	2.45
Phosphoric acid	.017	.13

Over nine-tenths of this material is vegetable matter. It has much less sand and earth mixed with it than most of the samples which we have examined.

The nitrogen of muck or peat is usually in a very inert condition, but as an amendment peat is very valuable on some soils.

REVIEW OF THE FERTILIZER MARKET.

For the Twelve Months ending December 31, 1891.

Nitrogen.

Nitric Nitrogen.

The *wholesale* quotation of nitrogen in nitrates has fluctuated greatly during the last year on account of the political disturbances in Chili. The agreement of the producers to limit the output of nitrate of soda, so as to maintain prices was suspended by the seizure of the mines by the Congressional party who sold all the nitrate possible to obtain means for carrying on the war with Balmaceda. The Balmaceda government however, began proceedings to exact an export duty in this country, on nitrate which had already paid a duty to the Congressional party. Finally when the Balmaceda party collapsed, the original agreement as to limiting the output is stated to have been put in force again.

The nitrogen of nitrate of soda cost in New York at *wholesale* in January, 1891, 10.9 cents per pound. It rose rapidly till April when it cost 14.4 cents, fell again to 11.3 cents in August and then rose to 13.6 in October, and was quoted at 13.3 in December.

The average wholesale cost for the year 1890 was 11.5 cents per pound; for the year 1891, 12.9 cents per pound.

The *retail* price of nitrogen in nitrate of soda in this State during the last season has been about 15.7 cents per pound. See page 27.

Ammonic Nitrogen.

The *wholesale* price of nitrogen in sulphate of ammonia has fallen somewhat during the year. It was 16.5 cents per pound in January, 1891, began falling in May to 16 cents, in October to 14.7 cents, at which price it was quoted till the end of the year.

The average wholesale price of nitrogen in this form in 1890 was 16 cents per pound, in 1891, 15.6 cents.

The *retail* price of nitrogen in sulphate of ammonia in this State during the last season was about 17½ cents per pound. See page 28.

Organic Nitrogen.

The wholesale price of nitrogen in Dried Blood has been somewhat higher in 1891 than 1890. It has fluctuated between 11.0 cents per pound in January and 12.6 cents in November, while the average price for the year for nitrogen in red blood has been 12.3 cents per pound; for nitrogen in black blood 11.7 cents. In 1890 these average prices were 11.8 cents per pound in red blood and 11.3 cents in black blood.

Nitrogen in Azotin has been quoted through the year at 11.5 cents per pound at *wholesale*, this being somewhat lower than the average for the previous year.

Dried Fish Scrap which is considerably used in mixed fertilizers has risen in price during the year from $19.25 per ton in January to $19.75 in April, $20 in June, $21 in July, $21.35 in August, $21.75 in September, and $23.75 in December.

Acidulated Fish has also risen from $9.50 per ton in January, 1891, to $13.25 in November and December.

As has been shown by the analyses and quotations given on previous pages, Organic Nitrogen has *retailed* this year in Connecticut at the following prices:

In Castor Pomace.....	13.9 to 15.7 cents per pound—see page 29.
In Cotton Seed Meal..	13.4 to 15.3 cents per pound—see page 29.

Dried Blood is not sold in any quantity in the State at retail, organic nitrogen being purchased either in cotton seed meal, castor pomace, bone or tankage.

PHOSPHATIC MATERIALS.

Refuse Bone Black has remained steady through the year at $18.50 per ton.

Rough Bone and Ground Bone have been steady at $21.50 and $26.50 respectively.

Bone Meal, quoted at $22.75 in April has risen to $23.25.

Ground Charleston Rock, quoted at $9.75 till June has been quoted since then at $9.25 per ton.

Acid Phosphate, 14 per cent. available, has been quoted throughout the year at 73¾c. per unit which is equivalent to 3.7 cents per pound for available phosphoric acid.

The *retail* price of available phosphoric acid in dissolved bone black, which is the only form of plain superphosphate in our market at present has been about 8 cents per pound in Connecticut. See page 31.

POTASH.

Muriate of Potash.

The *wholesale* price of actual potash in this form has advanced during the year from 3.58 to 3.68 cents per pound.

Actual potash in this form has been sold at *retail* in Connecticut the past year for 4.2 cents per pound. See page 32.

Double Sulphate of Potash and Magnesia.

The *wholesale* quotation has remained constant through the year at 4.53 cents per pound for actual potash till December, when it was quoted at 4.63 cents.

Potash in this form has cost at *retail* in Connecticut from 5.6 to 5.9 cents per pound. See page 32.

High Grade Sulphate of Potash.

This material contains about the same per cent. of potash as the muriate but is entirely free from chlorides.

The *wholesale* quotations have made actual potash cost 4.33 cents per pound during the whole year till December when it rose to 4.41 cents.

It has not, to our knowledge, been retailed in Connecticut this year.

Kainit.

Kainit has sold at *wholesale* from $8.75 to $10.00 per ton during the year, the average price being $9.25, at which price the actual potash of kainit would cost about 3.8 cents per pound *wholesale.*

The market quotations given above are taken from the "Oil Paint and Drug Reporter," published in New York. The weekly quotations for each month are averaged, and this average is taken as the quotation for the month.

The following explanations will help in the examination of the market quotations, and will also show the basis on which they have been interpreted in this review:

Phosphate rock, kainit, bone, fish-scrap, tankage, and some other articles are quoted and sold by the ton. The seller usually has an analysis of his stock and purchasers often control this by an analysis at the time of purchase.

Sulphate of ammonia, nitrate of soda and muriate of potash are quoted and sold by the pound, and generally their wholesale and retail rates do not differ very widely.

Blood, azotin and ammonite are quoted at so much "per unit of ammonia." To reduce ammonia to nitrogen, multiply the per cent. of ammonia by the decimal .824 (or multiply the percentage of ammonia by 14 and divide that product by 17). A "unit of ammonia" is one per cent., or 20 pounds per ton. To illustrate: if a lot of tankage has 7.0 per cent. of nitrogen, equivalent to 8.5 per cent. of ammonia, it is said to contain 8½ units of ammonia, and if quoted at $2.25 per unit, a ton of it will cost 8½×2.25= $19.13.

The term "ammonia" is *properly* used only in those cases where the nitrogen actually exists in the form of ammonia, but it is a usage of the trade to reckon all nitrogen, in whatever form it occurs, as ammonia.

To facilitate finding the actual cost of nitrogen per pound from the cost per unit of ammonia in the market reports, the following table is given:

Ammonia at	$3.00	per unit is	equivalent to	nitrogen at	18.2	cts. per lb.
"	2.90	"	"	"	17.6	"
"	2.80	"	"	"	17.0	"
"	2.70	"	"	"	16.4	"
"	2.60	"	"	"	15.8	"
"	2.50	"	"	"	15.2	"
"	2.40	"	"	"	14.6	"
"	2.30	"	"	"	14.0	"
"	2.20	"	"	"	13.4	"
"	2.10	"	"	"	12.8	"
"	2.00	"	"	"	12.2	"
"	1.90	"	"	"	11.6	"
"	1.80	"	"	"	11.0	"

Commercial Sulphate of Ammonia contains on the average 20.5 per cent. of nitrogen, though it varies considerably in quality. With that per cent. of nitrogen (equivalent to 24.3 per cent. of ammonia),

At 4	cents per lb.	Nitrogen	costs	19.5	cents per lb.
" 3⅞	"	"	"	18.9	"
" 3¾	"	"	"	18.3	"
" 3⅝	"	"	"	17.6	"
" 3½	"	"	"	17.0	"
" 3⅜	"	"	"	16.4	"
" 3¼	"	"	"	15.8	"
" 3⅛	"	"	"	15.2	"
" 3	"	"	"	14.6	"
" 2⅞	"	"	"	14.0	"
" 2¾	"	"	"	13.4	"

Commercial Nitrate of Soda averages 95 per cent. of the pure salt or 16.0 per cent. of nitrogen.

If quoted at	3.0	cents per lb.	Nitrogen	costs	18.8	cents per lb.
"	2.9	"	"	"	18.2	"
"	2.8	"	"	"	17.5	"
"	2.7	"	"	"	16.9	"
"	2.6	"	"	"	16.2	"
"	2.5	"	"	"	15.6	"
"	2.4	"	"	"	15.0	"
"	2.3	"	"	"	14.4	"
"	2.2	"	"	"	13.8	"
"	2.1	"	"	"	13.2	"
"	2.0	"	"	"	12.5	"
"	1.9	"	"	"	11.9	"
"	1.8	"	"	"	11.3	"
"	1.7	"	"	"	10.6	"

Commercial Muriate of Potash and also High Grade, 98 per cent., Sulphate of Potash usually contains 50½ per cent. of actual potash.

If quoted at	2.60	cents per lb.	Actual Potash	costs	5.15	cents per lb.
"	2.50	"	"	"	4.95	"
"	2.40	"	"	"	4.75	"
"	2.30	"	"	"	4.55	"
"	2.25	"	"	"	4.45	"
"	2.20	"	"	"	4 35	"
"	2.15	"	"	"	4.25	"
"	2.10	"	"	"	4.15	"
"	2.05	"	"	"	4.06	"
"	2.00	"	"	"	3.96	"
"	1.95	"	"	"	3.86	"
"	1.90	"	"	"	3.76	"
"	1.85	"	"	"	3.66	"
"	1.80	"	"	"	3.56	"
"	1.75	"	"	"	3.46	"
"	1.70	"	"	"	3.36	"

The Double Sulphate of Potash and Magnesia has about 26½ per cent. of actual potash.

If quoted at	1.00	cent per lb.	Actual Potash	costs	3.77	cents per lb.
"	1.05	"	"	"	3.96	"
"	1.10	"	"	"	4.15	"
"	1.15	"	"	"	4.34	"
"	1.20	"	"	"	4.53	"

The following table shows the fluctuations in the wholesale prices of a number of fertilizing materials in the New York market, since January, 1889. The price given for each month is average of the four weekly quotations in that month. Sulphate of ammonia is assumed to contain 20.5 per cent. and nitrate of soda 15.6 per cent. nitrogen, and muriate of potash 50½ per cent. of actual potash or 80 per cent. of the pure salt.

WHOLESALE PRICES OF FERTILIZING MATERIALS.

		Dried Blood.		Cost of Nitrogen at wholesale in			Cost of Potash at wholesale in			
		Red. Cents per pound.	Black or low grade. Cents per pound.	Azotin or Ammonite. Cents per pound.	Nitrate of Soda. Cents per pound.	Sulphate of Ammonia. Cents per pound.	Muriate of Potash. Cents per pound.	Double Manure Salt. Cents per pound.	High Grade Sulphate of Potash. Cents per pound.	Available Phosphoric Acid in Dissolved South Carolina Rock. Cents per pound.
1889.	January	16.5	16.1	16.6	15.1	16.6	3.66	4 63	5.00	4.30
	February	16.6	16.2	17.0	15.0	16.6	3.66	4.44	5.01	4.37
	March	16.6	16.2	17.1	15.2	16.6	3.66	4.48	4.88	4.20
	April	16.0	16.0	16.1	14.6	16.2	3.57	4.44	4.85	4.10
	May	15.2	14.9	15.2	13.8	15.7	3.64	4.49	4.65	4.06
	June	15.0	14.6	14.6	12.8	15.2	3.64	4.53	4.60	4.06
	July	14.8	14.3	14.2	12.5	15.1	3.64	4.53	4.56	4.06
	August	14.3	13.8	14.2	11.9	15.0	3.64	4.53	4.56	4.06
	September	14.0	13.7	14.2	12.1	15.0	3.64	4.44	4.66	4.06
	October	13.8	13.2	13.7	12.2	15.0	3.64	4.44	4.67	4.06
	November	13.6	12.9	13.6	12.3	15.4	3.64	4.44	4.75	4.06
	December	12.6	12.2	13.3	12.4	15.4	3.64	4.44	4.98	4.06
1890.	January	12.4	11.9	12.7	12.1	15.4	3.64	4.44	4.97	4.06
	February	12.4	11.8	12.5	12.0	15.4	3.64	4.44	4.97	4.06
	March	12.1	11.8	12.2	11.9	15.4	3.64	4.44	4.89	4.06
	April	12.0	11.7	12.2	11.2	15.4	3.64	4.42	4.77	4.06
	May	11.9	11.3	12.2	11.2	15.3	3.62	4.42	4.77	4.05
	June	11.9	11.4	12.1	11.2	15.8	3.62	4.42	4.77	4 00
	July	11.9	11.4	12.0	11.2	16.6	3.62	4.42	4.77	3.69
	August	11.6	11.0	11.5	11.0	16.6	3.62	4.42	4.77	3.69
	September	11.3	10.7	11.3	11.1	16.6	3.62	4.42	4.77	3.69
	October	11.4	10.8	11.7	11.6	16.5	3.62	4.42	4.17	3.69
	November	11.5	10.9	11.4	11.6	16.5	3.55	4.27	4.06	3.69
	December	11.5	10.9	11.4	11.6	16.5	3.62	4.53	4.31	3.69
1891.	January	11.0	10.5	11.5	10.9	16.5	3.58	4.53	4.33	3.69
	February	12.0	11.0	11.5	12.5	16.5	3.58	4.53	4.33	8 69
	March	12.5	11.9	11.5	14.3	16.5	3.68	4.53	4.33	3.69
	April	12.4	12.0	11.5	14.4	16.5	3.68	4.53	4.33	3.69
	May	12.3	11.7	11.5	13.6	16.0	3.68	4.53	4.33	3.69
	June	12.3	11.7	11.5	13.2	15.5	3.68	4.53	4.33	3.69
	July	12.2	11.6	11.5	12.2	15.4	3.68	4.53	4.33	3.69
	August	12.3	11.8	11.5	11.3	15.4	3.68	4.53	4.33	3.69
	September	12.3	12.0	11.5	12.2	14.8	3.68	4.53	4.33	3.69
	October	12.3	12.0	11.5	13.6	14.7	3.68	4.53	4.33	3.69
	November	12.6	12.3	11.5	13.5	14.7	3.68	4.53	4.23	3.69
	December	12.4	12.1	11.5	13.3	14.7	3.63	4.63	4.41	3.69

OBSERVATIONS ON A HERD OF MILK COWS.

The work below described is not a rigidly conducted experiment, but rather a somewhat careful observation carried on for about five months, of the rations fed, milk produced, difference in the yield of individual cows, etc., in a herd kept on a large and well-managed farm near New Haven. The object was to gather data of general interest to milk producers, which might also suggest future experiments or methods of producing milk at less cost. All the observations, determinations of fat and calculations here cited are made without the help of laboratory appliances and can be made as well by any practical feeder who has the publications of the Station at command.

At the farm referred to is a herd of about sixty milk cows. The milk produced is sold in New Haven, partly at wholesale to hotels and restaurants, partly at retail to families on two milk routes.

The herd is wholly of "natives." There were at the time no cows in the herd which even approached pure breed as far as could be learned.

It has been the practice to buy in cows from any source as needed, and turn them off to the butcher when they were judged to be unprofitable milkers.

This herd was well housed. The temperature of the stables during the winter never went below 37° and only on one day below 40°. On one day it rose to 64°, but except on that one day never rose over 58°.

The cows had fresh running water always before them in their stalls, having an average temperature of about 33°.

They were turned out to exercise for half an hour daily, except in stormy weather.

The following observations were made on the cows standing in one section of the stable, nineteen in number, and representing, as far as could be judged, the average of the herd.

It was not possible to learn how long each cow had been in milk or the average time of the herd since calving. A record is kept of the date when each cow is due to calve, but the record of dates of last calving was not in such shape that it could be fully depended on, and some of the cows were not with calf till some months after the time of last calving.

An extreme instance is No. 9, which was served every month, from September to March, and so went without calf for six months.

About half the herd was due the following September and one-third of the herd in August.

Judging from all the data at hand, it is likely that the herd on the average was about two or three months in milk at the beginning and six or seven months in milk at the end of the test. No cow calved or dried off during the time of the observation.

The time of milking was very regularly kept at five o'clock, both morning and afternoon, and the cows were milked daily in nearly the same order, so the milkings of each cow were at very regular intervals of twelve hours.

The milk of each of the nineteen cows was accurately weighed by Mr. A. W. Ogden, chemist of this Station, morning and evening and a sample taken, in which the butter fat was regularly determined and the other ingredients in some cases.

This was done from late in November till early in April, with such omissions as pressure of other work and accidents made unavoidable. The weights were recorded on 92 days out of 133.

A record was also kept of the kind and quantity of feed used through the winter.

From the records of these observations the following statements are compiled :

I. Average Yield per Day and Head of Milk and Fat, and Per Cent. of Fat.

By Months.

Herd of Nineteen Cows.

	Pounds of Milk.	Equivalent Quarts of Milk.	Ounces of Butter Fat.	Per cent. of Fat in the Milk.
In November	19 lbs. 8 oz.	9.1	13.2	4.24
December	19 " 13 "	9.2	13.4	4.22
January	22 " 12 "	10.6	13.9	3.80
February	21 " 15 "	10.2	13.1	3.73
March	21 " 2 "	9.8	13.7	4.08
April	19 " 2 "	8.9	13.0	4.23
Average of the months Dec., Jan., Feb., March	**21 " 6 "**	**9.95**	**13.5**	**3.95**

Observations were made on the last seven days only of November and the first nine days of April, so that these two months are excluded in the average statement.

It appears that in four months out of the six, the per cent. of butter fat was above 4.0, but in February it fell to 3.7. The cause of the somewhat sudden decrease of fat in February in connection with its rise again in March does not appear.

The average yield of fat per day and cow, 13½ ounces, if separated as perfectly as possible by the centrifugal and churned with only a usual loss of fat in the butter-milk, would give less than a pound of butter per day. But the most important feature with a herd whose milk is sold to consumers is the yield of milk.

About ten quarts per day and head is the average for this herd during the time when the cows were between three months and seven months in milk.

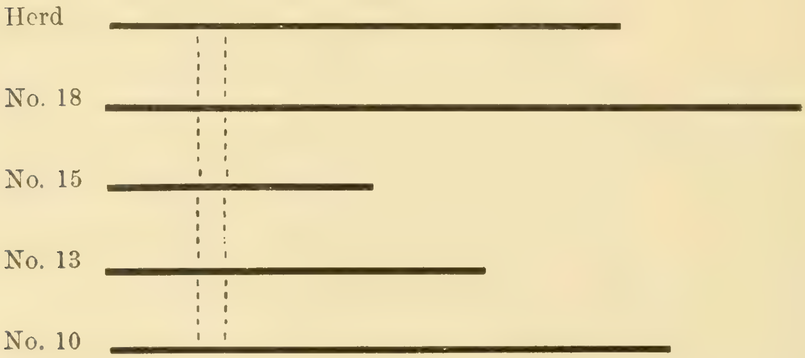
The next table shows the average yield of the whole herd of nineteen cows for the *six* months, and in comparison the yield of some individual cows in the herd.

II. AVERAGE YIELDS PER DAY AND HEAD OF MILK AND OF BUTTER-FAT FROM INDIVIDUAL COWS FOR SIX MONTHS.

	Whole Herd.	No. 18. Giving the most milk.	No. 15. Giving the least milk.	Two Cows about equally old in milk.	
				No. 13.	No. 10.
Quarts of Milk	9.6	13.1	4.8	7.0	10.4
Ounces of Fat	13.4	19.4	10.0	10.9	14.8
Per cent. of Fat	4.05	4.35	6.03	4.54	4.13

The comparative yields of milk are represented by the lengths of the lines below.

COMPARATIVE YIELD OF MILK.



The herd as has been said, was about two months in milk at the beginning of the test.

No. 18, the best milker, slipped her calf at seven months just as the test began and was in full milk during the whole of the test. She gave per day three and a half quarts more milk than the average of the herd, and three-eighths of a pound more of butter-fat; her milk contained three-tenths per cent. more of fat than that of the herd.

No. 15 was due to calve early in July and did not calve later than August, 1890. She was probably older in milk than the most of the herd. She gave only half as much milk as the average cow in the herd, four and four-fifths quarts per day, nearly three and a half ounces less of fat, but the per cent. of fat was very high, 6.03. Of course a comparison between two cows, one of which is near the beginning of lactation and the other near the end, is unfair, though so great a difference as there is between the yield of No. 18 and No. 15 cannot be explained in this case by the period of lactation.

The last two columns of the table show the yields of two cows which are comparable in respect to being about equally old in milk. No. 10, the larger milker of the two calved in May, 1890, two months earlier than No. 13, and both were due to calve August, 1891.

Here are two cows, costing the same for feeding and care, the better of the two is two months older in milk than the poorer and while the one gives 10.4 quarts a day for the six months, the other gives only 7 quarts, a difference of 3.4 quarts per day, or for the six months, of 615.4 quarts or more than $40 worth of milk.

Roughly figured the difference in the yield of fat would make a difference of 50 pounds of butter in the six months.

III. The Feed of the Cows.

Total quantity of feed eaten.

The ration was changed somewhat several times during the observations, partly to make it cheaper without making it less nutritious and partly because of the difficulty of getting a full supply of brewers' grains. No marked or sudden change in the yield of milk or butter-fat was noticed in consequence of these changes. During four months—121 days,—(and at the same rate during the whole period of observation) the herd consumed *per head*:

	In 4 Months.	Per Day.
Hay	1240 pounds.	10¼ pounds.
Stover or corn-stalks	1283 "	10⅝ "
Turnips	302 "	2½ quarts.
Brewers' grains	1578 "	13 pounds.
Corn meal	21 "	0.17 "
Bran	70 "	0.57 "
Corn and cob meal	273 "	2.2 "
Sugar feed	228 "	1.9 "

The second column represents the *average* ration per day. No cow on any one day received all of the feeds named. The ration was changed several times as already said, and the second column is obtained by dividing the total quantity of food eaten by each cow in four months by the total number of days, viz: 121.

Gross Cost of the Feed.

To determine this with accuracy is impossible. The cost of production on any farm varies from year to year with the season, efficiency of farm help and superintendence, etc., and in any case many of the factors in the cost cannot be ascertained with accuracy. But the following figures have been assumed with the belief that so far as they relate to feed raised on the farm they will fully cover actual cost of production, and are too high rather than low. In calculating the cost of producing milk, of course the feed raised at home should be put into the account, not at its selling price, but at cost of production.

Hay is valued at $10.00 per ton, corn-stalks at $3.00, turnips at 15 cents per bushel, corn-meal at $19.00 per ton, corn and cob meal at $17.00.

Of the boughten feed bran cost $25.00, sugar feed $23.50, and brewers' grains 10 cents per bushel of 60 pounds.

Reckoned on this basis the *gross* cost of the feed *per head* for 121 days was $18.21.

Manurial Value and Net Cost of the Feed.

The *net* cost of the feed will be found by deducting from the gross cost the manure value of the feed.

Basing calculation on the average composition of the feed used the quantities of nitrogen, phosphoric acid and potash fed to each cow during the four months will be as given in the table below.

In this time the cows gave on the average 2,586 pounds or 1,202 quarts of milk.

The quantities of nitrogen, phosphoric acid and potash contained in this milk, supposing it to be of average quality, are also given in the table. It will be seen that nearly a third of both the nitrogen and phosphoric acid of the feed may go in the milk.

The third column of the table gives the quantity of the three ingredients which are to be credited to the manure account, and the last column their valuation. In this calculation phosphoric acid and potash are valued as in commercial fertilizers at 7 and 4½ cents per pound respectively, but nitrogen is valued at only 8 cents per pound. This is done in order to be on the safe side, and in view of the losses of nitrogen from the manure pile both by its escape as nitrogen gas, and in the leaching and drainage, and also in view of the more inert condition of the nitrogen of manure as compared with that of the high grade nitrogenous fertilizers like nitrate of soda, sulphate of ammonia, dried blood, cotton-seed meal, etc.

POUNDS OF NITROGEN, PHOSPHORIC ACID AND POTASH IN THE FEED, MILK AND MANURE OF ONE COW IN FOUR MONTHS.

	In the Feed.	In the Milk.	In the Manure.	Valuation of that in the Manure.
Nitrogen	46.6	15.5	31.1	$2.49
Phosphoric acid	18.3	5.8	12.5	.88
Potash	38.8	3.3	35.5	1.60
				$4.97

Deducting this from the gross cost of the feed, $18.21 there remains $13.24, which may be called the net cost of the feed of one cow for four months, or 121 days. For a single day then, on the average, a single cow's feed costs 15.05 cents gross or 10.94 cents net.

If milk is selling at 7 cents a quart, 2.15 quarts of each cow's milk must go to pay the gross cost of her feed or 1.56 quarts to pay the net cost of it.

Applying these figures to those given on page 98 under II, it appears that on the average, 16 per cent. of the milk of the herd was needed to cover the net cost of their feed. Less than 12 per cent. of her milk paid for the feed of the best milker, while 32½ per cent., nearly one-third, of the milk of the smallest milker was needed to cover the cost of her feed.

This proportion is also shown by the dotted transverse lines in the diagram on page 98. The space to the left of the lines represents the part of the total yield of milk which was needed to cover the gross and net cost of the feed.

The Digestible Matter of the Feed.

As has been already said the ration was changed a number of times. But if the total quantity of feed of all kinds used in the four months had been evenly divided per day and head, it would have given a ration like that which follows. Assuming 875 pounds as the average weight of a cow, this digestible matter is calculated to 1000 pounds live weight in order to compare it with the "standard."

By the aid of the published tables of the average composition and digestibility of feeds it is possible to calculate, somewhat roughly, the quantity of digestible food, i. e. of actual nutriment that each cow daily received in this ration. The results of this calculation are as follows:

DIGESTIBLE MATTER IN THE RATION PER DAY AND HEAD.

	Dry Organic Matter.	Albuminoids.	Fiber.	Nitrogen-free Extract.	Fat.
Hay, 10¼ pounds contain	8.13	.37	1.78	2.61	.10
Stover, 10⅗* pounds contain	6.39	.27	1.26	2.24	.06
Turnips, 4.7 pounds contain	.41	.03	----	.28	---
Brewer's Grains, 13.0 lbs. contain	2.85	.54	.17	.96	.14
Corn Meal, .2 pounds contain	.15	.01	----	.11	.01
Bran, .6 pounds contain	.49	.07	.02	.25	.02
Corn and Cob Meal, 2.2 lbs. cont'n	1.84	.15	.09	1.30	.07
Sugar Feed, 1.9 pounds contain	1.66	.33	.06	.88	.15
	21.92	1.77	3.38	8.63	.55

	Organic Matter.	Albuminoids.	"Carbohydrates." Fiber and Nitrogen-free Extract.	Fat.
Per 1000 pounds live weight	25.04	2.02	13.72	.63
"Standard"	**24.0**	**2.5**	**12.5**	**.4**

The terms here employed scarcely need explanation to our stock feeders. A somewhat extended discussion of their meaning and use will be found on pages 89–111 of the Station Report for 1886.

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* The digestible matter is reckoned on nine pounds of stalks, as it was found by trial that the cows left 1⅗ pounds uneaten, and that the uneaten portion had approximately the same composition as the rest.

It should be specially noted in this connection that the albuminoids, sometimes called "flesh-formers," are essential to the growth of all the tissues of the body, and therefore are particularly concerned in the production of milk, which is not a mere secretion, but rather a liquefied tissue; and if albuminoids are deficient in the food one of two things must happen: either the milk yield will shrink or the animal will consume other tissues, i. e. its own flesh and blood to produce it. The albuminoids also, rather than the fat or the starch of the feed, are most largely concerned in the production of the butter fat of milk.

The food-ingredients of each feed consists of two parts, the digestible portion which alone is real nutriment and the ballast or waste portion which goes directly through the animal into the dung and does not nourish the body at all. The proportion of these two parts in different feeds varies greatly.

For instance only about 56 per cent. of the albuminoids of good meadow hay is digestible, but 87 per cent. of that of linseed meal is digestible.

For these reasons in comparing feeds we need to calculate, not the total quantity of the albuminoids, but the quantity which is digestible and actually useful to the animals.

The "standard" represents about what a cow weighing one thousand pounds needs per day of the several food ingredients, to keep her body from waste and maintain a full flow of milk.

The standard itself is the result of a number of very accurately made tests, in each of which the weight of the animal was determined as well as the daily weight and composition of the feed, the excrement and the milk.

In comparing the average ration of the herd with the standard it appears that the cows have had an abundance of food, 25 pounds per day of organic matter as against 24 of the standard, but it also appears that while they have had 1.2 pounds more "carbohydrates" (starch, sugar, fiber, etc.), and one-fifth of a pound more fat than the standard requires, there has been half a pound less per day of the albuminoids, or "flesh-formers;" only four-fifths of the quantity required by the standard.

Of course the feeding standard is a general statement, represents an average and is not to be too literally taken. It is only a general guide, but the above comparison suggests the inquiry whether the ration fed was not seriously deficient in albuminoids and wasteful of the "carbohydrates."

NOTES ON THE ABOVE OBSERVATIONS.

1. *Ventilation.*—During these observations there was on certain days a sudden and large shrinkage in the quantity of milk; in one extreme case the loss amounted to over 15 quarts in a day from 19 cows. There was no irregularity in the time of milking or in the temperature of the stables, and no reason could be discovered for the shrinkage, except the fact that a brisk cold wind was followed the next day by warm still air. While this made no particular difference in the temperature of the stable it made a very noticeable difference in the quality of the air. The stable became close with a strong odor and at the same time the milk fell off greatly, but increased again when conditions changed.

While connection between milk yield and ventilation could not be proved in these cases it appeared highly probable. Pure air is as essential as warm air and where the herd is large and housed with great economy of space it is harder to secure under all conditions of weather.

2. *Yield of Milk and Fat from the Herd and from Individual Cows.*—It is believed that this herd was better fed, housed and tended than the general average of Connecticut herds of native stock, that the stock was as good as the average, and their yield of milk fully as good and probably above the average.

It was not far from ten quarts per day and head for the winter months.

No one wishes to be content with average efficiency but aims to secure the highest yield possible.

How then can the efficiency of the herd be increased?

Looking first at the cows themselves it appears that certain ones gave 3½ quarts a day more than the average, while others gave almost 5 quarts less than the average; that some were profitable cows to keep, while others were an expense all the time to their owners.

To find out which are the unprofitable ones is not a difficult matter. An observant man who is at the milking every day will know them well enough. But if the herd is large and hired men milk, the owner is not likely to know surely unless he will go to the trouble, which is small compared to the advantage gained, of making tests for at least three or four days in the month.

With a spring balance and a couple of pails whose weight has been brought to even pounds, by soldering on a piece of lead if necessary, it is only half a minute's work to pour each cow's milk as brought by the milker into one of these pails, hook it on the scale and read and record the weight. It is much quicker and more accurate than to measure. But pounds of milk may be readily reduced to quarts by dividing by 2.15.

A few such tests made monthly will show what each cow is doing from the time of calving till she dries off, and to judge of her merits or demerits one needs to know this. If cream rather than milk is sold, the Babcock milk tester should be used in connection with the test of milk yield and can readily be used on the farm as well as in the laboratory.

Having fixed on the unprofitable cows of the herd the next step is to get rid of them and at the same time substitute something better. This is not easy.

If it be granted, as is claimed by breeders of pure stock, that thoroughbreds are more profitable for milk men than "scrubs," this knowledge is small help to a man who has from five to forty natives in his herd and very limited uninvested capital. He cannot turn off one herd to a butcher or to some less thrifty neighbor and buy a new thoroughbred herd.

If he turns off the poorest cows and buys in other natives as he can pick them up, he very soon finds, as was remarked in a recent dairy meeting, that the seller is also engaged in improving his herd and the buyer is likely to be no better off than he was before. The very best cows are never for sale; the very poorest cows are always for sale.

A third way which finds more favor among patrons of creameries than among those who sell whole milk is the raising of calves for one's own herd.

Most cattle keepers can afford to get and keep a thoroughbred bull which comes from stock with good milk records. This establishes the foundation for a good herd. His get, even from the "scrub" cows, are likely to be much better milkers than the average native cows which are "picked up" in emergencies here and there. And at any time when a few thoroughbred cows can be introduced, the improvement of the herd will go on more rapidly. The raising of calves looks more formidable where skim milk from the creamery is not available for feed, but in the long run may be the cheapest means of improving the herd and so lessening the cost of producing milk. Only good cows will make it pay to produce milk. The producer has got to raise them himself or pay to have some one else do it for him. The former course will often be the best.

3. *Quality of the Feed.*—In 1881 the Station examined the rations fed on several good farms in this State and found in general more carbohydrates and less albuminoids in the rations than is given in the standard. The same thing appears in the ration which has been discussed and probably it is generally true of the feeding in this State.

It is quite likely that a pound or a pound and a half or even more per day and head of either linseed meal, gluten meal or cottonseed meal, with a corresponding diminution of the more starchy feed, corn meal, bran, etc., would have noticeably improved this ration and will improve the rations of other feeders in this State. In some cases it may happen that the flow of milk will not be noticeably increased, but that nevertheless the milk will be made from the feed instead of the cow's flesh and in consequence she will come out better in the spring.

An excess of albuminoids in the feed is not wholly wasted for the undigested portion enriches the manure. An excess of carbohydrates is less perfectly digested than where a proper proportion of albuminoids is present, and what goes into the manure is dead loss, having no manurial value.

THE BABCOCK METHOD OF DETERMINING FAT IN MILK.

The following statements on this subject, most of which were made in Bulletin No. 106, it seems best to record here in view of the great interest which is taken in the matter and the frequent inquiries about it.

Of the various quick methods for determining fat in milk and cream which have been proposed of late, the Babcock method has been most widely adopted and to us seems the safest, most convenient and rapid.

Description of the Method.—The principle of the method is this: to a carefully measured quantity of the milk in a flask provided with a narrow accurately graduated neck, made for the purpose, is added a definite quantity of strong oil of vitriol which dissolves all the solid matters of the milk except the fat. The flasks thus charged, are rapidly whirled in a centrifugal apparatus by which all the fat is brought to the surface of the mixture in a few minutes. Hot water is then added to raise this layer of melted fat into the graduated neck of the flask. The length of the fat layer, as read off on the graduation, gives at once the per cent. of fat. It may be of advantage to any one who gets this Tester to see it at the Station and learn some particulars of manipulation that can be better appreciated by seeing than by reading of them. Any one can, however, get perfectly satisfactory results for himself without further instruction than is given in the directions which accompany the machine.

The apparatus which has been used by the Station lately at the meeting of the Dairymen's Association and at farmers' institutes is made by Porter Blanchard's Sons, Nashua, N. H. A convenient apparatus is also made by the Vermont Farm Machine Co., Bellows Falls, Vt.

Rapidity of the Test.—This depends largely on the skill and activity of the operator. In the Station laboratory, a person skilled in handling such apparatus, but who has worked with this method only a few times has made determinations of fat in 40 samples of milk in an hour and forty-eight minutes.

This included time spent in mixing the milk in the sample bottles, measuring milk, acid and fat, labelling and cleaning all the flasks and apparatus used, recording the results, and leaving everything in perfect order for the next use; in short *every* thing involved in any way with the operation. This is more than twice as rapid work as we were able to do at first and is made possible simply by having the apparatus conveniently arranged for the work.

Accuracy of the method.—The accuracy of this method of determining the quantity of butter-fat in whole milk has been fully tested at several stations and is settled beyond dispute.

Our own tests have given the following results. The average difference between the quantity of fat shown by this method and that shown by the standard method used in chemical laboratories, was less than one one-hundredth of one per cent. in 32 comparative tests. The greatest difference in any single case was .18 per cent. In six cases the difference exceeded .10 per cent. and in 18 cases it was .05 or less.

In 17 cases the standard method gave a lower result than the Babcock method, in 15 cases a higher result.

That is, on the average where 100 pounds of butter-fat were actually present, the Babcock test showed $99\frac{99}{100}$ pounds.

The widest discrepancy in any single case was $\frac{18}{100}$ pound or about three ounces of fat in 100 pounds.

In the majority of cases the discrepancy was $\frac{4}{5}$ of an ounce or less in 100 pounds of fat.

Accuracy of sampling indispensible.—To get a perfectly fair sample of each patron's milk is the most critical thing of all. As soon and as often as milk stands at rest, its constituents begin to separate, the cream rising to the surface. The contents of a forty quart can may be thoroughly mixed with a long handled dipper *if time and pains are taken to do it*, but it will require more time than one who has not tried it would suppose, to thoroughly mix the whole so that different samples from the same can will show the same quantity of fat when tested. The most thorough mixing is done by pouring the whole quantity of milk from one can into another.

For sampling large quantities of milk, the Vermont Station, Bulletin No. 21, recommends a sampling tube. This is simply a piece of brass tube of suitable length and an inch in diameter, having an iron wire running through it, centered by a wire loop within the tube near each end. One end of this wire is bent to form a handle, the other bears a disc of sheet iron with a rubber packing over it. The tube is passed vertically downwards in the milk, the disc being kept away from the tube allowing it to fill as it goes down. Then the wire is drawn up, thus closing the bottom of the tube, and the tube is withdrawn, bringing with it a core or section of milk, which should represent accurately the whole quantity of milk.

This "milk thief" we have found very convenient in sampling either milk or cream.

Where the method is used by milk-gathering creameries it is very desirable to sample the milk daily, but to make the tests less frequently, perhaps once a week. To do this fairly a sample of each day's milk from each patron is put into a suitable bottle or jar, of which as many are required as there are patrons. Each jar contains an antiseptic powder which will keep the milk sweet till the end of the week when the fat in each so-called "composite sample" is determined, and the patrons are credited with the butter-fat they have supplied.

Any creamery wishing particulars of this process would do well to apply to the Iowa Experiment Station, Ames, Iowa, for Bulletins No. 9 and No. 11, and for the "Relative Value Table." The chemist of that Station, Prof. Patrick, has originated and carefully worked out the details.

The creamery of J. B. Sandford in Redding, in this State, is now paying for milk according to the butter-fat in it as shown by the Babcock test. The results are understood to be very satisfactory alike to owner and patron while the system of paying for pounds of "milk" supplied, was extremely unfair both to the proprietor and to a part of the patrons, as was shown by tests made at the creamery.

That this must be so in all cases the following considerations show.

The average per cent. of fat in 206 samples of the milk of herds carefully drawn at creameries in this State and analyzed at this Station, was 3.98, or in round numbers four per cent.

That is, if this whole quantity of milk had been mixed thoroughly together, a hundred weight of it would have contained four pounds of butter-fat.

But as was to be expected the milk from the individual dairies was of various quality. The milk of one herd contained 5.25 per cent. of fat, that of another 3.28 per cent. of fat, and while the percentage varied somewhat from day to day yet the milk of certain herds was *uniformly* rich in fat while that of other herds was as *uniformly* poor.

These figures mean that a hundred pounds of milk, furnished by one patron, brought to the creamery five and a quarter pounds of fat, but a hundred pounds of milk from his neighbor's herd brought only three and a quarter pounds. This is an extreme case. If for illustration we assume that the milk of A's herd contains 5 per cent. of fat and that of B's herd 3.5 per cent. we have a difference between the herds which is not by any means extreme in Connecticut to-day.

A and B we will suppose produce the same quantity of milk per week, 1500 pounds, and are paid at the rate of $1.10 per hundred or about $2\frac{35}{100}$ cents per quart. (The actual price paid by different creameries is not known). Their receipts are therefore the same, $16.50 per week.

For this, A furnishes to the creamery 75 pounds ($1500 \times \frac{5}{100}$) of butter-fat and B furnishes $52\frac{1}{2}$ pounds.

That is, crediting nothing to the skimmed milk of which each patron supplied the same quantity; A, the patron who produces the richer milk, who has the better cows or who feeds more rationally, gets 22 cents a pound for butter-fat, and B the patron whose milk is the poorest, whose herd is poor or feeding injudicious, gets 31.4 cents a pound. This is a premium of 10 cents per pound of fat on thin milk, or poor stock and feeding, or on judicious watering of the milk.

It presents little inducement to better the herd or to feed for quality rather than quantity of milk.

It is obviously very unfair to all the parties concerned and bears heardest on A who has an exceptionally good herd or who feeds exceptionally well.

Now suppose this creamery changes its policy and offers as before $1.10 per hundred for "standard" milk containing four per cent. of fat but allows $2\frac{3}{4}$ cents per hundred additional for every "unit" or tenth of a per cent. of fat more than four in the milk and deducts $2\frac{3}{4}$ cents per hundred for every "unit" or tenth per cent. under four.

The two accounts will stand as follows:

Patron A. Milk contains 5 per cent. of fat.

15 hundred weight of milk, @ $1.10	$16.50
Add for 10 units per hundred, or 150 units of fat @ $2\frac{3}{4}$ cents	4.13
	$20.63

Patron B. Milk contains 3.5 per cent. of fat.

15 hundred weight of milk, @ $1.10	$16.50
Deduct for 5 units per hundred, or 75 units of fat @ 2¾ cents	2.07
	$14.43

Under this arrangement A has received $20.63 for his 1500 pounds of milk and has furnished 75 pounds of butter-fat. He has therefore received 27½ cents per pound for the butter-fat.

B has received $14.43 for 52½ pounds of butter-fat, and for each pound 27½ cents, the same that his neighbors receive for a like amount of butter-fat.

Neither A nor B can increase his receipts by watering or skimming milk nor by increasing the flow of milk at the expense of quality.

These particular prices are for nothing more than to illustrate the point. The actual rate to be paid must depend of course on what it costs the creamery to make and sell the butter.

The appearance of the Tester itself at a creamery, and of some one making tests on each patron's milk, has had in some cases a marked effect on the quality of the milk furnished thereafter.

For instance, in one case a Station chemist with the tester examined at a creamery the milk of each patron as he brought it. The milk of the previous week had made 270 pounds of butter. The following week the milk brought to the creamery fell off 590 quarts, but the butter made was 269 pounds, only a pound less than the week before.

It is believed that the practice of paying for butter-fat rather than for milk—which is rendered practicable by the methods referred to above—will gradually reduce the cost of producing butter, will increase the profits of the honest and intelligent patrons and offer more inducement than there now is for improving herds and feeding liberally for quality rather than quantity of milk.

It must be borne in mind that the Tester shows the percentage of *pure butter-fat* in the milk, not of "cream" or of butter. "Cream" varies much in composition and may contain as low as 16 per cent. of pure butter-fat or as high as 30 per cent. or even higher. Butter contains from 75 to 87 per cent. of pure butter-fat. More or less of the butter-fat of the milk however is lost in butter making, chiefly in the skimmed milk and in the butter milk.

MISCELLANEOUS NOTES ON MILK.

Solids and Fat in the Milk of Herds.

The following data on this subject have accumulated during the year. The figures refer to the milk of patrons as received at creameries.

	Feb. 19.	Feb. 20.	Mar. 7.	Mar. 12.			May 10.	Nov. 1.
No. of patrons	35	36	33	31	50	15	24	27
Solids, average per cent.	----	----	----	----	13.60	12.14	12.73	13.48
" maximum	----	----	----	----	14.93	13.38	14.44	14.93
" minimum	----	----	----	----	11.90	10.91	11.79	11.90
Fat, average per cent.	3.85	3.95	4.05	4.0	4.5	3.91	3.87	*4.52
" maximum	4.4	4.8	5.0	4.6	5.25	4.39	4.94	5.25
" minimum	3.1	3.2	3.3	3.6	3.38	3.31	3.28	3.38

Following are the results of examination of the milk of a herd of "three full blood Holsteins and nine common cows." A creamery superintendent witnessed the milking and took the sample which was drawn on March 20th:

	March 12.	March 20.
Specific gravity at 15° C.	1.030	1.032
Total solids	11.28	11.51
Fat	3.47	3.48

Effect of Sickness on the Yield and Composition of Milk.

During the observations on a herd of milk cows, described on pages 96 to 106, two cows at different times were "off their feed" for a few days. The cause and nature of the trouble, which did not appear very serious, is not known. Neither cow was in heat at the time.

The effects on the yield and composition of the milk are interesting.

Cow No. 10 for a week previous had been giving on the average 22½ pounds of milk per day, 16 ounces of butter fat, while the per cent. of fat in the morning's and night's milk ranged from 3.5 to 4.3.

On the 23rd of February it was noticed that she did not eat well. Her yield of milk and of butter fat for the next few days were as follows:

---

* Twelve patrons.

	Pounds of Milk.	Ounces of Fat.
Feb. 23	18½	---
" 24	15⅕	13.2
" 25	12	11.3
" 26	15	10.4
" 27	17⅓	11.4

Her daily yield was not up to what it was before her sickness till March 7.

A full analysis of her milk when she was sickest is given in the table which follows.

Cow No. 9 was seen to be off her feed on December 9.

Her record just before and during her sickness is as follows :

	Pounds of Milk.	Ounces of Fat.	Per cent. of Fat in morning's and night's Milk.
Dec. 6	21	12.6	3.9, 3.6
" 8	20¼	12.3	3.9, 3.7
" 9	22⅜	14.4	4.2, 3.9
" 10	16	8.0	2.2, 3.9
" 11	7½	7.5	4.0, 7.0
" 12	11 15/16	12.5	6.0, 7.0
" 13	13 13/16	10.0	4.3, 4.8
" 15	15⅞	10.1	4.1, 3.9

On the 22d her yield had risen to 19 7/16 pounds, which was about her average before her sickness.

In both these cases there was a large shrinkage both of milk and of butter fat, while the per cent. of fat rose noticeably, showing that the shrinkage of fat was less than that of the milk. Analyses of this milk appear in the following table:

COMPOSITION OF MILK FROM SICK COWS.

	No. 10.				No. 9.	
	Feb. 23, night.	Feb. 24, morning.	Feb 24, night.	Feb. 25, morning.	Dec. 11, night.	Dec. 12, morning.
Casein or curd *	3.44	2.97	3.18	3.13	2.55	2.49
Butter fat	5.77	4.83	5.24	6.49	7.02	6.02
Sugar †	4.51	4.90	4.50	4.44	4.69	4.53
Ash	.85	.72	.79	.71	.63	.66
Total solids	14.57	13.42	13.71	14.77	14.89	13.70
Water	85.43	86.58	86.29	85.23	85.11	86.30
	100.00	100.00	100.00	100.00	100.00	100.00

* Nitrogen × 6¼. † By difference.

Composition of the Milk Solids.

Casein or curd	23.61	22.13	23.19	21.19	17.13	18.18
Butter fat	39.61	35.99	38.22	43.94	47.15	43.94
Sugar	30.95	36.51	32.82	30.06	31.49	33.07
Ash	5.83	5.37	5.77	4.81	4.23	4.81
	100.00	100.00	100.00	100.00	100.00	100.00

FAT IN THE FIRST OF THE MILKING AND IN THE STRIPPINGS.

The samples **A** to **D** were drawn by Mr. W. I. Bartholomew of Putnam, and tested at a dairy institute in April, 1891. **E** is from a registered Jersey cow. The figures given are the per cents of butter fat.

	A.	B.	C.	D.	E.
First milk drawn from the udder	2.8	1.6	3.4	1.5	1.6
Last " " " "	6.1	7.5	9.8	7.2	6.2

ON THE DETERMINATION OF SOLIDS IN MILK BY DRYING THE MILK ALONE.

The following tests, made by Mr. Winton, were to show whether the drying of milk by itself gave results practically identical with those obtained by the so-called "Sand Method."

The quantities of milk given below were heated on a water bath in a porcelain guano capsule with 10–15 grams of dry quartz sand, with frequent stirring, till most of the water was expelled and then in the drying oven at about 98° C. till the weight was constant.

For comparison, the quantities of milk given in the table below were brought into flat bottomed nickel dishes, having a diameter at the bottom of 2 inches and a height of $\frac{5}{8}$ inch. The drying was precisely as by the sand method, but without any stirring.

Weight of Milk used.	By Sand Method.	Dried in nickel dish.	The Sand Method gave more (+) or less (−).
2 grams	12.47	12.65	—.18
"	9.27	9.29	—.02
"	13.30	13.36	—.06
"	12.21	12.33	—.12
"	12.19	12.27	—.08
4.3 grams.	12.87	13.04	—.17
"	12.03	12.07	—.04
"	12.35	12.59	—.14
"	11.32	11.32	.00
"	10.91	10.88	+.03
"	13.38	13.39	—.01
3.3 grams.	11.82	11.89	—.07
"	11.36	11.49	—.13

In thirteen tests the extreme difference between the results by the two methods was .17 per cent.; the average difference was .08 per cent., and in eleven out of thirteen cases the sand method gave a lower result.

ON THE DETERMINATION OF THE FAT IN CREAM BY THE BABCOCK METHOD.

Most of the creameries in this State gather cream rather than milk and the cream is usually raised by deep setting in submerged cans at low temperatures. Inasmuch as cream raised by this method naturally varies considerably in its content of actual butter-fat and may easily be made to vary much more by fraud on the part of the creamery patron, a rapid, accurate and practicable method of determining fat in cream, for use in creameries, is particularly desirable here.

The Babcock method applied to cream has been thoroughly tested by Mr. Winton, chemist of the Station, with a view to its use by cream gathering creameries.

The same apparatus, bottles, acid and method have been employed as are recommended by Dr. Babcock with a single exception.

Mr. Winton has made and used in all the tests given below a pipette for measuring the cream which delivers 6 grams of cream quite accurately, *provided the cream was raised as above described.* The reading from the tube multiplied by three gives the per cent. of fat in the cream without further correction.

The pipette.—The pipette, made by Mr. Winton, is 6¼ inches long, narrow at each end, the internal diameter at one end being about ⅛ of an inch and at the other $\frac{1}{16}$ inch.

It is designed to deliver 6 grams of cream, as the milk pipette is designed to deliver 18 grams of milk. The actual quantity delivered in several preliminary trials was 5.97–5.95–6.00 and 5.93 grams.

The number of grams of water delivered (15° C.) by this pipette in a number of trials was

6.035
6.038
6.028
6.053
6.045
6.035
Average 6.039

The *volume* of cream delivered will be less than that of water because a larger proportion of the cream will adhere to the sides of the pipette.

Method of using the pipette.—The cream is very thoroughly mixed by moderate agitation,—violent shaking may churn it partially or beat it full of small bubbles which are very slow to rise,—and the pipette with one end well below the surface of the cream is sucked full, a little escaping into the mouth. The upper end is closed with the tongue, and the pipette withdrawn, its tip introduced into the neck of the flask and on removing the tongue the cream flows out. *As soon as it has run out*, the adhering drop is blown out and the pipette withdrawn.

The reason for making the pipette to be completely filled with cream rather than to be filled to a mark on its stem is that it is more difficult to observe in a tube the height of cream than of milk, as the former coats the walls of the tube more thickly. By filling the tube full moreover, any bubbles on the cream surface will be removed by the mouth.

Having measured the cream into the testing flasks it is only necessary to add to each, 12 centimeters of water, from a pipette made for the purpose, and then proceed exactly as in the case of milk only multiplying the per cent. of fat, as read from the graduations, by three.

Following is a complete account of the experiments thus far made with this method, with the exception of the first ten samples examined which were quite sour when tested and had not been raised by a uniform method.

The "gravimetric method" referred to below or the laboratory analytical method, which is the standard, consisted in weighing the cream accurately on asbestus fiber in a tube, drying at the heat of boiling water till the weight was constant, and then extracting the fat completely from the tube and asbestus with absolute, alcohol-free ether, evaporating the ether, drying at the temperature of boiling water and weighing the residual fat.

Creamery No. Collected Feb. 10th, 1891.	Solids.	Fat.		Babcock method gave more (+) or less (−) than Gravimetric Method.
		Babcock Method.	Gravimetric Method.	
3	----	21.3	21.16	+ .14
6	----	21.6	21.30	+ .30
9	----	18.9	18.64	+ .26
11	----	18.2	17.90	+ .30
19	----	20.25	20.34	+ .09
21	----	20.4	20.36	+ .04
22	----	17.7	17.76	— .06
23	----	20.25	20.17	+ 0.8
25	----	18.45	18.67	— .22
29	----	20.55	20.57	— .02
30	----	22.5	22.90	— .40

Collected Feb. 20, 1891.

2	27.40	20.4	20.16	+ .24
3	30.14	22.7	22.51	+ .19
4	25.69	18.6	18.49	+ .11
5	27.87	21.0	20.80	+ .20
6	27.40	21.9	22.09	— .19
7	27.52	19.8	19.66	+ .14
8	25.50	18.0	17.72	+ .28
9	28.36	21.0	21.02	— .02
11	31.18	23.9	23.54	+ .36
12	27.77	20.5	20.64	— .14
13	26.15	19.0	18.96	+ .04
14	28.70	21.9	21.94	— .04
15	26.38	19.9	19.64	+ .26
16	26.46	20.1	19.79	+ .31
17	26.91	19.8	19.66	+ .14
18	26.57	19.5	19.15	+ .35
19	27.45	20.4	20.23	+ .17
20	27.13	20.4	20.58	— .18

Collected March 27, 1891.

1	----	19.8 19.8	20.14	— .34
2	----	20.7 20.7	20.98 20.99	— .28
3	----	21.0 21.3	21.37 21.39	— .22
4	----	19.2 19.5	19.76 19.66	— .36
5	----	20.7 20.4	20.27 20.45	+ .19
6	----	22.8 23.1	22.66 23.08	+ .08
7	----	21.0 21.0	20.94 21.00	+ .03
8	----	18.3 18.3	18.25 18.26	+ .04
9	----	18.3 18.3	18.21 18.46	— .03
10	----	20.4 20.4	20.57 20.58	— .17

Collected April 23d, 1891.

1	27.15	20.4 20.7	20.51	+ .04
4	26.77	20.1 20.4	20.35	— .10
5	26.74	20.7	20.74	— .04
6	27.67	22.2	22.26	— .04

Collected April 23d, 1891.

7	29.71	23.4 23.4	23.81	— .41
8	28·53	21.3 2 1.6	21.60	— .15
9	26.48	19.8	20.36	— .56
10	28.78	21.9	22.16	— .26
11	27.91	20.7 20.1	20.42	— .02
13	27.42	21.0	20.80	+ .20
14	27.77	21.0	20.97	+ .03

Results.—The average quantity of fat as determined in the fifty tests above given, by the Babcock method was 20.46 per cent. and by the gravimetric or standard method was the same, 20.46 per cent.

In 26 cases the former gave a higher result than the latter, in 24 cases the reverse was true.

In 18 cases the variation of the two methods was a tenth of one per cent. or less; in 35 cases the variation was less than a quarter of one per cent.; in 7 cases the difference exceeded a third of one per cent. and the extreme difference was .56 per cent. The same facts may be expressed as follows:

In 36 per cent. of the tests the variation from the standard method was not more than one-tenth of a per cent.

In 70 per cent. of the tests the variation from the standard method was not more than a quarter of a per cent.

In 86 per cent. of the tests the variation from the standard method was not more than a third of a per cent.

In 98 per cent. of the tests the variation from the standard method was not more than a half of a per cent.

In considering these figures and the accuracy of the method it must be borne in mind that the per cent. of fat is from four to six times as great in cream as in milk and hence a larger difference in the percentage of fat found in cream by the two methods may not involve any larger proportion of the total quantity of butter fat than a much smaller difference in the per cent. of fat found in milk by the two methods involves in the total quantity of the fat of milk.

To illustrate. If a sample of milk contains 4 per cent. of fat and the Babcock method shows 3.92, the agreement is all that could be desired. The per cent. difference is only .08. That is out of 4 pounds of fat .08 of a pound or 2 per cent. is missing. Now if a sample of cream contains 20 per cent. of fat and the

Babcock method shows 19.60, the per cent. difference is .40 which is five times as large as in the case of milk. Yet *proportionally* no more fat is lost than in milk, i. e., two per cent.

In more than four-fifths of the cases above cited the error is considerably less than this.

The results above given lead us to believe that the Babcock method may be made of very great value to cream-gathering creameries. It offers to them a practicable and accurate method of ascertaining the actual quantity of butter fat which each patron furnishes so that payments may be based not on volume of cream supplied but on *actual butter fat*, which is the raw material that the creamery manufactures. This is obviously the most satisfactory method of payment. For this purpose each patron's cream should be weighed and sampled and the fat in it determined by the method described.

Since the work above described was done, Mr. J. M. Bartlett of the Maine Experiment Station, has published * a description of two new forms of testing bottles for cream, graduated from 0–25 and from 0–35 per cent. respectively. He also finds that the pipette used for milk can be used as well for cream if graduated to 18 cc.

The result of 19 tests made by him showed very good agreement with the gravimetric test.

The use of a pipette, in which the cream is drawn to a mark on the stem rather than to fill the pipette, is a very great advantage and renders possible the use of antiseptics with the cream where necessary.

A few experiments made in the laboratory of this Station with the 18 cc. pipette and flasks of the same size and shape as the flask used for milk tests,—*except that the graduated portion, while of the same length had three times the capacity of the graduated part of the ordinary flasks*—have given the following results: In column A are percentages found by the use of apparatus described on page 115, in column B the percentages found in the same samples, using for the determinations an 18 cc. pipette and the flasks just described with the larger graduated part.

A.	B.
18.00	17.95
21.90	21.70
18.60	19.00
21.60	21.40
20.40	20.80
22.20	22.60

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* Me. Expt. Station, Bull. 3, Second Series, Sept. 1, 1891.

The accuracy of the determination of fat in cream by the Babcock method is beyond any doubt.

The questions which remain to be settled are, first, can cream in considerable quantity be accurately sampled, secondly, can composite samples of cream be kept for a week at any season of the year and the fat accurately determined at the end of that time, and thirdly, is it necessary each day to take a portion of the cream for the composite sample which shall bear relation to the total quantity of cream it represents, or is it sufficiently accurate to take each day for the composite sample, the same quantity of each patron's cream.

The Station began experiments on these points as promised in Bulletin 105, but the work has been necessarily interrupted for a time.

On Variations in the Composition of Cream Raised by Deep Setting at Low Temperatures.

The following observations were made on cream collected from creamery patrons who set their milk in deep submerged cans where it stood from 12 to 24 hours before collection by the cream-gatherer. The samples were drawn from mixtures of the cream of morning and evening setting.

SOLIDS.—Thirty-seven tests made at two creameries gave an average of 27.55 per cent. of solids. The highest per cent. found was 31.18, the lowest 25.18.

BUTTER FAT.—One hundred and sixty-five tests made at three creameries in different parts of the State gave for the average 19.85 per cent. of fat. The highest per cent. found was 24.9, the lowest 13.8 per cent.

The widest variations in the per cent. of fat in the cream furnished by individual patrons of one creamery on the same day were 13.8-21 per cent. and in another case 18.3-24.9 per cent. The smallest daily variations at any one creamery were 19.0-21.9 per cent.

The Composition of Cream and Butter-milk and the Loss of Butter-Fat in Churning.

Through the courtesy of the superintendent of one of the creameries in the State the following test was made:

All the work of making the butter was done in the usual way by the butter-maker; the station chemists weighed the cream and products of the churning and analyzed them.

There went into the churn 467.5 pounds of ripened cream and 12 pounds of water. After churning there were added in two different portions 116.5 pounds of water for washing the butter. The two washings were separately weighed and analyzed.

Analyses of the Cream and Products of Churning.

	Cream.*	Butter-milk.	First washing.	Second washing.	Butter.
Ash	.60	.67	.24	.21	5.22†
Albuminoids	2.75	3.31	2.56	1.14	1.62
Fat	18.33	.20	.10	.07	79.81
Sugar	3.80	4.35	3.90	1.90	----
Water	74.52	91.47	93.20	96.68	15.35
	100.00	100.00	100.00	100.00	100.00

The next table shows the number of pounds of each of these ingredients which went into the churn and the quantity of each that went into the butter, the butter-milk and the washings.

Churning Account.

Taken out of the Churn.	Ash. Pounds.	Albuminoids. Pounds.	Fat. Pounds.	Sugar. Pounds.	Water. Pounds.
Butter-milk 238 pounds	1.59	7.88	.48	10.35	217.70
First washing, 167½ pounds	.40	4.29	.17	6.53	156.11
Second washing, 68½ pounds	.14	.78	.05	1.30	66.23
Butter [salted], 108½ pounds	3.49	1.76	86.59	----	16.65
Water lost in working butter	----	----	----	----	17.11
	5.62	14.71	87.29	18.11	456.69
Put into the churn, cream and water	2.88	13.19	87.89	18.22	473.8

The excess of "ash" in the products of the butter, 2.74 pounds, is the salt added in working. The 1.52 pounds of albuminoids appearing as taken out of the churn in excess of what was put in is to be charged to errors and losses in weighing.

There is a loss of .11 pounds of sugar to be explained in the same way. Of the 87.89 pounds of butter-fat put into the churn, .60 pounds were lost in the butter-milk and washings. This amounts to .68 of one per cent. of the total quantity of fat.

* Includes the 12 pounds of water added before churning.

† Salt.

BUTTER ANALYSES.

In a following table are given the analyses of eleven samples ot butter from private dairies and six samples of creamery butter. These butters were entered in the exhibit at the Connecticut Dairymen's Association which met in Hartford, January 20–22, 1891. The score of points for each butter is also given. The method of making award was as follows: Number of possible points, 100. Minimum number allowed in awarding premiums 85. Divide the total premium by the total number of points scored above the minimum. The quotient is the amount to be awarded for each point scored above the minimum.

To illustrate : Of the creamery butters,

No. 9 scored 14 points above the minimum.
" 7 " 14 " "
" 4 " 10 " "
" 1 " 4 " "
" 5 " 3 " "
" 6 " 0 " "

Total points scored........ 45. Total premium to be divided, $70.00. Each point scoring above the minimum therefore gets $\frac{70}{45}$ = $1.555 and the premiums awarded are as follows:—

No. 9 and No. 7, each $21.78, No. 4, $15.55, No. 1, $6.22 and No. 5, $4.67.

PRIVATE DAIRY BUTTER.

Scale of Points.

	Perfect.	No. 5.	No. 11.	No. 4.	No. 6.	No. 7.	No. 2.	No. 1.	No. 8.	No. 9.	No. 3.	No. 10.
Flavor	50	48	45	46	44	40	47	30	21	20	20	15
Grain	25	23	23	23	22	23	22	24	17	15	15	5
Color	15	15	15	12	12	12	6	15	14	13	13	3
Salt	5	5	4	4	5	3	3	4	4	3	1	1
Package	5	5	4	5	5	5	1	5	0	4	3	0
Total	100	96	91	90	86	83	79	78	56	55	52	24

Analyses.

	No. 5.	No. 11.	No. 4.	No. 6.	No. 7.	No. 2.	No. 1.	No. 8.	No. 9.	No. 3.	No. 10.
Water	10.86	11.01	12.27	8.59	12.74	11.54	10.09	10.99	10.04	9.37	11.38
Curd	1.32	1.28	.91	1.44	1.42	2.00	1.83	2.53	.94	1.24	1.11
Salt	1.86	5.23	1.18	2.32	2.76	4.11	4.22	3.47	2.44	7.83	6.78
Fat	85.96	82.48	85.64	87.65	83.08	82.35	83.86	82.01	86.58	81.56	80.73
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Specific gravity of the butter-fat at 100° C.	.8666	.8644	.8667	.8646	.8646	.8657	.8640	.8642	.8652	.8650	.8662

CREAMERY BUTTER.

Scale of Points.

	Perfect.	No. 9.	No. 7.	No. 4.	No. 1.	No. 5.	No. 6.
Flavor	50	49	50	48	46	49	44
Grain	25	25	25	23	22	21	21
Color	15	15	14	15	13	10	9
Salt	5	5	5	4	3	3	3
Package	5	5	5	5	5	5	5
Total	100	99	99	95	89	88	82

Analyses.

Water	11.38	8.89	11.38	7.97	8.35	6.54
Curd	.96	.94	1.18	.90	1.00	1.58
Salt	2.65	2.14	3.17	2.88	2.30	3.96
Fat	85.01	88.03	84.27	88.25	88.35	87.92
	100.0	100.0	100.0	100.0	100.0	100.0
Specific gravity of the butter-fat at 100° C.	.8644	.8648	.8647	.8644	.8645	.8646

The judge of the creamery butter was Mr. H. K. House of the Allyn House, Hartford ; of the private dairy butter, Mrs. Thomas Fairclough, of Waterbury. Tunxis Creamery, Robertsville, and Green's Farms Creamery, Westport, took first premiums.

The average composition of the creamery and private dairy butters and the range of percentage of each ingredient are as follows:

	CREAMERY BUTTER.		PRIVATE DAIRY BUTTER.	
	Range of percentage.	Average composition.	Range of percentage.	Average composition.
Water	6.5–11.4	**9.1**	8.6–12.7	**10.8**
Curd	.9– 1.6	**1.1**	.9– 2.5	**1.5**
Salt	2.1– 4.0	**2.9**	1.2– 7.8	**3.8**
Fat	84.3–88.4	**86.9**	80.7–87.7	**83.9**
		100.0		**100.0**

The private dairy butters which received the lowest grading for flavor, grain and salt were ones which had the very abnormally high per cents. of salt (6.78 and 7.83).

It is somewhat surprising that No. 11, with 5.23 per cent. of salt, should have scored as high as it did.

The creamery butter as a rule carried 3 per cent. more of actual butter-fat than the private dairy butter.

PROTEIDS OR ALBUMINOIDS OF THE OAT-KERNEL.

SECOND PAPER.*

By THOMAS B. OSBORNE, PH.D.

I. PREPARATION OF A GLOBULIN FROM THE SO-CALLED ALBUMINATE.

In a paper on the proteids of the oat-kernel published in the Report of this Station for 1890, the writer described a globulin obtained from the oat-kernel by extraction with a ten per cent. sodium chloride brine heated to 65° C. [Preparation **20**]. It was shown that this globulin differs from that extracted by the same brine at 20° C. both in properties and composition and that on cooling the warm saturated solution of this body in dilute sodium chloride brine, crystals were several times obtained; once in the form of rhombohedra and at other times in the form of octahedra.

This globulin has been further investigated and the results obtained are the main subject of this paper.

When the oat-proteids brought into solution in cold brine† are precipitated by saturating the extract with ammonium sulphate, a considerable part of this precipitate is always found to have lost its solubility in the salt-solution, by conversion into a form called by Weyl "an albuminate" [**15, 16**]. In this state it is soluble in a one per cent. solution of sodium carbonate.

On treating ten pounds of freshly ground oats with brine, precipitating the filtered solution by saturating with ammonium sulphate and extracting the precipitate thus obtained with brine, it was found that a very large part of the globulin originally dissolved was converted into the so-called "albuminate." After washing this latter thoroughly with brine, to free it completely from the unchanged globulin, it was dissolved in a one per cent. sodium carbonate solution. About two-thirds of this solution was then treated with carbon dioxide for three hours, whereby a heavy white precipitate settled out. This precipitate was collected on a filter and allowed to drain over night. The next morning it was found to have become transparent and gummy about the edges.

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* Read at the meeting of the National Academy of Sciences in New York Nov. 10, 1891.

† Unless otherwise specified "brine" and "salt-solution" are to be understood in this paper to signify aqueous solutions of very pure sodium chloride containing ten per cent. of NaCl, used at common temperatures.

This precipitate was now completely soluble in salt-solution and had all the properties of the globulin [**20**] formerly obtained from the hot sodium chloride extract. The entire precipitate was then dissolved in one liter of brine and dialyzed for four days, during which time all but a trace of the substance separated out. The thus precipitated proteid was seen under the microscope to consist of spheroids of about one-tenth of a millimeter diameter or less, similar to those obtained by cooling a warm solution of the globulin, as described in my former paper. After filtering off, washing with alcohol, ether and absolute alcohol, twenty-one grams of air-dried material were obtained. This substance was completely soluble in brine and was precipitated therefrom by diluting with water or saturating with sodium chloride, or by adding minute quantities of hydrochloric, nitric or acetic acids.

In the entire absence of salts, extremely small amounts of the just named acids dissolved the proteid instantly and completely, but the addition of a little sodium chloride precipitated it from this solution, the extent of the precipitation depending on the relative quantities of the acid and salt present. The precipitation was complete when certain proportions of salt and acid were used. Addition of strong soda-lye to the solution of the proteid in dilute acid, gave a heavy precipitate, which dissolved but slowly in excess of soda, although the final mixture contained over twenty-five per cent. of sodium hydrate. Addition of copper sulphate to this alkaline solution gave the biuret violet. With Millon's reagent and with nitric acid the usual proteid reactions were obtained. Alcohol containing a minute amount of free acid dissolved the substance completely. Its composition was found to be as follows :

OAT PROTEID.—*Derived from Sodium Carbonate Solution of the "Albuminate."*

PREPARATION **21.**

			Ash-free.	
	I.	**II.**	**I.**	**II.**
Carbon	52.28	----	52.30	----
Hydrogen	6.98	----	6.98	----
Nitrogen	17.86	17.73	17.86	17.73
Sulphur	0.69	----	0.69	----
Oxygen	----	----	22.17	----
Ash	0.03	----	----	----
			100.00	

Ash.—0.6759 gram substance dried at 110° C. gave 0.0002 gram of ash =0.03 per cent.

Carbon and hydrogen.—0.4610 gram dried substance gave 0.8837 gram CO_2= 52.28 per cent. C., and 0.3220 gram H_2O=6.98 per cent. H.

Nitrogen.—I. [Dumas method].—0.3474 gram dried substance gave 52.15 cc. N, at 13° C. [barometer 768.2 mm. at 23° C.] = 17.86 per cent. N.

II.—Kjeldahl method].—1.0108 gram dried substance gave ammonia = 21. 8cc. HCl sol. [1 cc.=0.00822 gram N.] = 17.73 per cent. N.

Sulphur.—0.7695 gram dried substance gave 0.0380 gram $BaSO_4$=0.0052 grams S =0.69 per cent.

In all respects save one this substance behaved exactly like the globulin obtained by extracting ground oats with hot sodium chloride solution. The latter proteid dissolved to a turbid solution in cold, and to a perfectly clear solution, in hot distilled water. So far as the usual methods of analysis show, the two bodies are identical in composition as is seen from the following figures:

	GLOBULIN.—Extracted from oats by hot sodium chloride solution. Average of two analyses. Preparation 20.	GLOBULIN.—Derived from sodium carbonate solution of the "Albuminate." Preparation 21.
Carbon	52.22	52.30
Hydrogen	6.98	6.98
Nitrogen	17.82	17.86
Sulphur	0.77	0.69
Oxygen	22.21	22.17
	100.00	100.00
Ash	0.19	0.03

Another preparation of this substance was made by dissolving a second portion of the "albuminate" in two per cent. sodium carbonate solution, precipitating with carbon dioxide, washing thoroughly with water, dissolving in brine and diluting the solution with a large amount of water. The final snow-white precipitate was filtered off and, after washing with alcohol and ether, weighed eleven grams. Its properties are exactly the same as those of **20** except that it is slightly soluble in hot distilled water. Its composition, as determined by analysis, here follows:

OAT PROTEID.—*Derived from Sodium Carbonate Solution of the "Albuminate."*

PREPARATION **22.**

		Ash-free.
Carbon	51.98	52.05
Hydrogen	6.92	6.93
Nitrogen	17.83	17.85
Sulphur Oxygen	----	23.17
Ash	0.13	----
		100.00

Ash.—0.5437 gram substance dried at 110° C. gave 0.0007 gram ash =0.13 per cent.

Carbon and hydrogen.—0.5789 gram dried substance gave 1.1030 gram CO_2= 51.98 per cent. C and 0.3609 gram H_2O=6.92 per cent. H.

Nitrogen.—0.4230 gram dried substance gave 63 cc. N at 13° C. [barometer 773 mm. at 23° C.] = 17.83 per cent. N.

The filtrate from the precipitate produced by carbon dioxide in the preparation of the preceding substance [**22**] was diluted with an equal volume of water, further treated with carbon dioxide for about three hours and allowed to stand over night. The resulting precipitate was filtered off and washed with water, alcohol and ether. Five grams of substance having the same properties as preparations **21** and **22** were thus obtained. Analysis of this preparation gave the following results:

OAT-PROTEID.—*Derived from Sodium Carbonate Solution of the "Albuminate."*

PREPARATION **23.**

		Ash-free.
Carbon	52.16	52.35
Hydrogen	7.00	7.02
Nitrogen	17.68	17.73
Sulphur	0.73	0.73
Oxygen	----	22.17
Ash	0.36	----
		100.00

Ash.—0.5500 gram substance dried at 110° C., gave 0.0020 gram of ash = 0.36 per cent.

Carbon and hydrogen.—0.4388 gave dried substance gave 0.8393 gram CO_2= 52.16 per cent. C., and 0.2766 gram H_2O = 7.00 per cent. H.

Nitrogen.—0.3659 gram dried substance gave 54.36 cc. N, at 13° C. [barometer 767.6 mm. at 22° C.] = 17.68 per cent. N.

Sulphur.—0.9135 gram of dried substance gave 0.0484 gram $BaSO_4$ = 0.0066 gram S = 0.73 per cent. S.

II. CRYSTALIZATION OF THE GLOBULIN OBTAINED FROM THE SO-CALLED ALBUMINATE.

Three hundred cubic centimeters of one per cent. sodium chloride solution were heated to 70° C. with 5 grams, i. e. an excess, of preparation **21,** and filtered on a steam-jacketed funnel. On cooling, the filtrate rapidly deposited a large crop of rhombohedral crystals. The residue undissolved by the hot one per cent. brine was washed with the same weak brine heated to 70°. On cooling, the washings deposited octahedral crystals. This process was repeated several times with other portions of preparation **21.** In most cases the filtrate deposited rhombohedral and the washings octahedral crystals. The residues which had been filtered out were dissolved and crystallized as far as possible from one per cent. brine, yielding either octahedral crystals or mixtures of octahedra and rhombohedra. The different crops of crystals were collected on separate filters according as they were wholly rhombohedra or octahedra or mixtures of the two. Three preparations, **24, 25, 26,** were obtained in this way, which were, as usual, washed with water, alcohol and ether and dried at 110° for analysis. Thus prepared, they retained their crystalline form entirely unchanged and had in all respects the same properties as the mother substance, **21.**

Prof. S. L. Penfield kindly examined these crystals and states that they appear to be rhombohedra and octahedra although the former have no action on polarized light. He suggests that the apparent rhombohedra may be octahedra with but six faces developed, such crystals occurring in nature. As they were too small for measurement [less than one-tenth of a millimeter long], this point could not be definitely determined. Analyses of the three preparations gave the following results :

CRYSTALLIZED OAT-PROTEID, *derived from* **21.**

PREPARATION **24.**

		Ash-free.
Carbon	52.14	52.17
Hydrogen	6.96	6.96
Nitrogen	17.92	17.93
Sulphur	0.53	0.53
Oxygen	----	22.41
Ash	0.06	----
		100.00

Ash.—0.4600 gram substance dried at 110° C. gave 0.0003 gram of ash = 0.06 per cent.

Carbon and hydrogen.—0.4463 gram dried substance gave 0.8835 gram CO_2 = 52.14 per cent. C., and 0.2795 gram H_2O = 6.96 per cent. H.

Nitrogen.—0.4042 gram dried substance gave 63.0 cc. N. at 17° C. [barometer 756.3 mm. at 21° C.] = 17.92 per cent. N.

Sulphur.—0.6345 gram dried substance gave 0.0242 gram $BaSO_4$ = 0.0033 gram S = 0.53 per cent.

CRYSTALLIZED OAT-PROTEID, *derived from* **21.**

PREPARATION **25.**

		Ash-free.
Carbon	52.00	52.11
Hydrogen	7.09	7.10
Nitrogen	17.91	17.94
Sulphur	----	22.85
Oxygen	----	
Ash	0.20	----
		100.00

Ash.—0.2035 gram substance dried at 110° C. gave 0.0004 gram ash = 0.20 per cent.

Carbon and hydrogen.—0.2562 gram dried substance gave 0.4885 gram CO_2 = 52.00 per cent C., and 0.1635 gram H_2O = 7.09 per cent. H.

Nitrogen.—0.3935 gram dried substance gave 61.3 cc. N. at 17° C. [barometer 756.5 mm. at 21° C.] = 17.91 per cent. N.

CRYSTALLIZED OAT-PROTEID, *derived from* **21.**

PREPARATION **26.**

		Ash-free.
Carbon	52.23	52.25
Hydrogen	7.08	7.08
Nitrogen	17.81	17.82
Sulphur	0.52	0.52
Oxygen	----	22.33
Ash	0.05	----
		100.00

Ash.—0.3974 gram substance dried at 110° C. gave 0.0002 gram of ash = 0.05 per cent.

Carbon and hydrogen.—0.2866 gram dried substance gave 0.5489 gram CO_2 = 52.23 per cent. C., and 0.1828 gram H_2O = 7.08 per cent. H.

Nitrogen.—0.3123 gram dried substance gave 48.31 cc. N. at 17° C. [barometer 757.0 mm. at 21° C] = 17.82 per cent. N.

Sulphur.—0.3598 gram dried substance gave 0.0135 gram $BaSO_4$ = 0.0018 gram S = 0.52 per cent.

CRYSTALLIZED OAT-GLOBULIN *derived from* **21.**

	24. Rhombohedra.	**25.** Rhombohedra and Octahedra.	**26.** Octahedra.
Carbon	52.17	52.11	52.25
Hydrogen	6.96	7.10	7.08
Nitrogen	17.93	17.94	17.82
Sulphur	0.53	22.85	0.52
Oxygen	22.41		22.33
	100.00	100.00	100.00
Ash	0.06	0.20	0.05

No chlorine could be detected in these crystals. It is thus shown that the crystallized globulin, except for its slightly lower content of sulphur, has the same composition as the mother-substance and agrees in all respects with the globulin obtained directly from ground oats by extraction with hot salt solution and described in my former paper, except that it is not soluble in water and contains a little less sulphur.

It is further to be noted that the methods of preparation were suited to fractionally separate the substance into its component parts had it been a mixture of two or more globulins. It seems improbable that the sodium chloride which Grübler found in his crystallized globulin from squash seed was anything more than an accidental impurity. The ash of Grübler's preparations contained traces of the various salts present in the solutions from which they separated, and since the content of total mineral matters is variable and, as in my preparations 24 and 26, sometimes amounts to but .05 per cent. of the proteid, there appears to be no good ground for Grübler's assumption that crystallized proteids are definite compounds of globulin with sodium chloride or with other inorganic bodies.

III. GLOBULIN OBTAINED FROM GROUND OATS BY DIRECT EXTRACTION WITH SODIUM CARBONATE SOLUTION.

One hundred grams of ground oats were digested with a one per cent. sodium carbonate solution, the extract was filtered clear and the sodium carbonate converted into bicarbonate by treatment with carbon dioxide. The solution was then saturated with ammonium sulphate and the heavy precipitate filtered off. This precipitate was washed with a saturated solution of ammonium sulphate until the washings no longer reacted alkaline. The precipitate was then extracted thoroughly with salt solution and this extract dialyzed. After removal of the salts, by dialysis, the proteid, which had separated, was filtered off and washed with alcohol and ether. It weighed, air-dry, one and a half grams, being, therefore, about one and a half per cent. of the oat kernel. Dried at 110° for analysis it was found to have the following composition:

OAT PROTEID.—*Extracted from ground oats by Sodium Carbonate Solution and Soluble in Sodium Chloride Solution.*

PREPARATION **27.**

			Ash-free.	
	I.	II.	I.	II.
Carbon	51.68	----	51.82	----
Hydrogen	6.91	----	6.93	----
Nitrogen	17.92	17.91	17.95	17.94
Sulphur	----	----	23.30	----
Oxygen	----			
Ash	0.26		----	----
			100.00	

Ash.—0.2652 gram substance dried at 110° C. gave 0.0007 gram ash = 0.26 per cent.

Carbon and Hydrogen.—0.2296 gram dried substance gave 0.4350 gram CO_2 = 51.68 per cent. C and 0.1429 gram H_2O = 6.91 per cent. H.

Nitrogen, I.—0.3441 gram dried substance gave 52.15 cc. N at 13° C. [barometer 764.0 mm. at 25° C.]=17.92 per cent. N.

II.—0.3294 gram dried substance gave 50.14 cc. N at 14° C. [barometer 762.0 mm. at 23° C.=17.91 per cent. N.

From this analysis it is seen that this body is the same as that obtained from the oats by direct extraction with hot salt-solution, as well as from the "albuminate" by the methods just described.

IV. SUMMARY OF ANALYSES OF OAT-GLOBULIN.

The agreement of the analyses of the different preparations of the Oat-Globulin may be seen from the following table:

	20	21	22	23	24	25	26	27
Carbon	52.22	52.30	52.05	52.35	52.17	52.11	52.25	51.82
Hydrogen	6.98	6.98	6.93	7.02	6.96	7.10	7.08	6.93
Nitrogen	17.82	17.86	17.85	17.73	17.93	17.94	17.82	17.95
Sulphur	0.76	0.69	23.17	0.73	0.53	22.85	0.52	23.30
Oxygen	22.22	22.17		22.17	22.41		22.33	
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The writer has found nowhere any description of a vegetable proteid like this. Although its proportion of carbon is the same as that of the globulin extracted from oats by cold salt-solution, its nitrogen-content is one per cent. greater. It contains nearly a per cent. less of nitrogen, about one half per cent. more of carbon and but one-half as much sulphur as Chittenden & Hartwell* found in the globulin or "vegetable vitellin" of squash-seed.

Barbieri's analysis of squash-seed globulin agrees fairly well with these analyses of the crystallized oat-globulin, but carbon and sulphur are somewhat lower, nitrogen higher and as regards sulphur and nitrogen his analysis differs materially from the later ones of Chittenden & Hartwell.

Grübler's earlier analyses of squash-seed globulin which gave 53.21 per cent. of carbon and 19.22 per cent. of nitrogen were evidently incorrect, and in a recent publication† this chemist states the composition of crystallized proteid from squash-seed as given below, where the various analyses of vegetable globulin, except the earlier ones of Grübler, are tabulated.

I have obtained from flax-seed a crystallized globulin whose composition agrees quite nearly with that of the squash-seed vitellin.

The following table gives the composition of crystallizable globulin from various seeds:

COMPOSITION OF CRYSTALLIZABLE VEGETABLE GLOBULIN.

Ritthausen.			Barbieri.	Ritth.	Chittenden & Hartwell.			Grübler	Osborne.	
			Squash-seed.							
	Hemp cryst.	Castor bean cryst.	am'ph.	cryst.	cryst.	spheroid.	am'ph.	cryst.	Flax seed cryst.	Oats cryst.
C	50.98	50.88	51.88	51.61	51.60	52.03	51.81	51.48	51.36	52.18
H	6.92	6.98	7.51	7.00	6.97	6.93	6.94	6.76	6.94	7.05
N	18.73	18.58	18.08	----	18.80	19.08	18.71	18.14	18.66	17.90
S	0.82	0.77	0.60	----	1.01	1.04	1.01	0.96	0.82	0.53
O	22.55	22.79	21.93	----	21.62	20.92	21.53	22.66	22.22	22.34
	100.00	100.00	100.00	----	100.00	100.00	100.00	100.00	100.00	100.00
Ash		----	1.11	----	0.30	0.36	----	0.18	----	----

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* Journal of Physiology, **XI**, pp. 437–440.

† Jour. für prak. Chemie, **XLIV**, 369.

V. PROTEID EXTRACTED FROM GROUND OATS BY DIRECT TREATMENT WITH ALKALI CARBONATE.

The precipitate produced by saturating with ammonium sulphate the sodium carbonate extract of the oats from which the globulin **27** had been extracted, was next washed with warm eighty per cent. alcohol until all the proteid soluble in that liquid was removed. The residue was then found to be insoluble in one per cent. sodium carbonate solution and was therefore dissolved in two-tenths per cent. caustic potash solution, filtered and the dissolved proteid completely precipitated by neutralizing with dilute acetic acid. After washing the latter with water, alcohol and ether and drying at 110° its composition was as follows :

OAT PROTEID.—*Extracted from ground Oats by Sodium Carbonate Solution.*

PREPARATION **28.**

			Ash-free.	
	I.	II.	I.	II.
Carbon	53.25	----	53.63	----
Hydrogen	7.13	----	7.18	----
Nitrogen	15.99	15.89	16.11	16.01
Sulphur	0.81	----	0.82	----
Oxygen	----	----	22.26	----
Ash	0.72	----	----	----
			100.00	

Ash.—0.5661 gram substance dried at 110° C. gave 0.0041 gram ash = 0.72 per cent. ash.

Carbon and hydrogen.—0.3269 gram dried substance gave 0.6383 gram CO_2 = 53.25 per cent. C, and 0.2096 gram H_2O = 7.13 per cent. H.

Nitrogen.—I. 0.3637 gram dried substance gave 49.33 cc. N at 13° C. (barometer 761.5 mm. at 25° C.) = 15.99 per cent. N.

II. 0.3916 gram dried substance gave 52.95 cc. N at 13° C. (barometer 759.2 mm. at 23° C.) = 15.89 per cent. N.

Sulphur.—0.5000 gram dried substance gave 0.0295 gram $BaSO_4$ = 0.0041 gram S = 0.81 per cent. S.

If this analysis is compared with that of preparation **17**, which was obtained from ground oats by direct extraction with two-tenths per cent. potash solution, it will be seen that the two agree quite closely.

	28.	**17.**
Carbon	53.63	53.49
Hydrogen	7.18	7.01
Nitrogen	16.11	16.39
Sulphur	0.81	0.99
Oxygen	22.27	22.12
	100.00	100.00
Ash	0.72	1.00

These two bodies are thus shown to be essentially the same in composition and the results of direct extraction with alkali given in the previous paper are confirmed.

VI. Conclusions.

The proteids of the oat kernel undergo great change in contact with water or sodium chloride solution. The body extracted by direct treatment of ground oats with alcohol differs much in properties and composition from that extracted by alcohol after the ground oats have had contact for some time with water or sodium chloride solution.

Direct treatment with sodium carbonate solution yields the same globulin as that obtained by direct treatment with hot sodium chloride solution, but a different globulin from that obtained by direct treatment with cold sodium chloride solution. Sodium carbonate solution also extracts another proteid the same as that yielded by direct extraction with dilute potash-lye which, again, is distinct in composition from that obtained after the oats have been in contact with water. It is remarkable that all these transformations are the result of the use of water or salt-solution as contrasted with the use of three agents known to suspend or destroy ferment-action, viz: alcohol, alkali or heat.

The fact that the globulin extracted after treatment of the ground oats with alcohol has the same composition as that obtained by direct treatment with sodium chloride, would indicate that alcohol temporarily suspends a ferment-action which is induced by water or solutions of neutral salts.

It is probable that the primary proteids originally contained in the oat-kernel are the three following bodies:

Primary Oat-Proteids.

	Alcohol-soluble Proteid. Average of five analyses.	Salt-soluble Proteid or Globulin. Average of nine analyses.	Alkali-soluble Proteid. Average of two analyses.
Carbon	53.01	52.19	53.56
Hydrogen	6.91	7.00	7.09
Nitrogen	16.43	17.86	16.20
Sulphur	2.26	0.65	0.90
Oxygen	21.39	22.30	22.25
	100.00	100.00	100.00

Of the above substances the alcohol-soluble proteid forms about one and a quarter per cent., the globulin about one and a half per cent., and the alkali-soluble body the remainder of the proteids contained in the oat-kernel, with the possible exception of extremely small amounts of proteose and acid-albumin. The two latter substances are quite probably the results of change occurring during extraction; the evidence, however, on this point is not conclusive.

Three other proteids are obtained evidently by the alteration of the primary proteids, and probably through ferment-action, when the ground-oats are subjected to contact with water or solutions of neutral salts. The composition of these derived or secondary proteids is as follows:

SECONDARY OAT-PROTEIDS.

	ALCOHOL-SOLUBLE PROTEID. Average of four analyses.	SALT-SOLUBLE PROTEID OR GLOBULIN. Average of four analyses.	ALKALI-SOLUBLE PROTEID. Average of two analyses.
Carbon	53.70	52.34	52.49
Hydrogen	7.00	7.21	7.10
Nitrogen	15.71	16.88	17.11
Sulphur	1.76	0.88	0.80
Oxygen	21.83	22.69	22.50
	100.00	100.00	100.00

It would appear that none of the proteids from the oat-kernel have been obtained and analyzed in a state of purity by previous investigators. The author therefore reserves the right to revise the nomenclature of these bodies, after further progress in his researches on the other vegetable proteids, with which he is now engaged.

THE PROTEIDS OF THE MAIZE KERNEL.*

BY PROFESSOR R. H. CHITTENDEN AND DR. THOMAS B. OSBORNE.

1. The maize kernel contains several distinct proteids well characterized in reactions and composition. Of these there are three globulins, and one or more albumins, all occurring in small proportion and an alcohol-soluble proteid which is relatively abundant.

2. The substance obtainable from the maize kernel by extraction with 10 per cent. solution of sodium chloride and separation by dialysis, or by precipitation with ammonium sulphate, followed by dialysis—is mainly a mixture of two globulins, differing from each other in composition and in coagulation points.

3. The mixed globulins can be approximately separated from each other by fractional heat-coagulation or by deposition from warm dilute salt-solution. In the former process there is formed a small amount of proteose-like bodies.

4. The two globulins separable by the above methods, are a myosin-like body and a vitellin-like body.

The myosin-like globulin agrees closely in composition with animal myosin as shown by the following analyses. It has, however, a coagulation point (in 10 per cent. sodium chloride solution) of about 70° C.

	MAIZE MYOSIN. Average of two analyses.	ANIMAL MYOSIN. Average of analyses of 13 preparations from various sources.
Carbon	52.66	52.82
Hydrogen	7.02	7.11
Nitrogen	16.76	16.77
Sulphur	1.30	1.27
Oxygen	22.26	22.03
	100.00	100.00

The vitellin-like globulin is almost entirely non-coagulable by heat, when dissolved in dilute salt-solutions. It is more soluble in warm than in cold salt-solutions and when separated from the former, either by cooling the fluid or on dialysis, almost invariably appears in the form of small spheroids.

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* This paper is a brief summary of the results of an extended investigation of the Proteids of Indian Corn carried on during 1890 and 1891, in the Sheffield Biological Laboratory of Yale University. The full details of the research are printed in the *American Chemical Journal*, vol. xiii, pp. 453–468 and pp. 529–552, and vol. xiv, pp. 20–44. The Indian Corn used was the White Dent variety raised on the farm of Mr. J. H. Webb, near New Haven, and was freshly ground at this Station as required.

It has the following composition :

MAIZE VITELLIN.

	Average of six analyses.
Carbon	51.71
Hydrogen	6.85
Nitrogen	18.12
Sulphur	0.86
Oxygen	22.46
	100.00

5. These two globulins exist as such in the maize kernel, as is evident from the coagulation points of their salt-solution, from the fact that their separation can be accomplished without the aid of heat; and lastly since it is possible to extract the individual globulins directly from the kernel by the use of appropriate solvents.

6. Direct extraction of the finely powdered maize meal with water yields a dilute salt-solution which dissolves the myosin, leaving the bulk of the vitellin undissolved. Probably the character of the salts present in the kernel plays an important part in this separation. From this solution the myosin can be separated in a fair degree of purity by the usual methods.

7. Extraction of maize meal with 10 per cent. sodium chloride solution, after previous extraction with water, dissolves the vitellin, which can be separated from this solution by the customary methods. So prepared it agrees exactly in composition with the vitellin separated by heat-coagulation from the mixed globulins.

8. The third globulin present in the maize kernel is characterized by extreme solubility in very dilute salt-solutions, especially of phosphates and sulphates. It separates from such solutions only by prolonged dialysis, i. e., not until nearly every trace of the salts has been removed. It coagulates in a 10 per cent. sodium chloride solution in the neighborhood of 62° C. and has the following composition :—

MAIZE GLOBULIN.

Highly soluble.

Carbon	52.38
Hydrogen	6.82
Nitrogen	15.25
Sulphur	1.26
Oxygen	24.29
	100.00

9. Through the long continued action of water and also of strong solutions of salts, as ammonium sulphate, the myosin and the globulin noticed in the preceding paragraph are changed into insoluble modifications, soluble however in 0.5 per cent. sodium carbonate solution, from which solution they are precipitated, on neutralization, apparently as albuminates. So prepared these insoluble modifications are characterized by a relatively high content of carbon.

10. An aqueous extract of maize meal as well as a sodium chloride extract apparently contains in addition to the globulins, two albumin-like bodies, more or less coagulable by heat, but, as prepared, unlike in chemical composition. Owing to the difficulties encountered in separating these albumins their composition could not be determined with certainty.

11. A small amount of proteose can be detected in the extracts of maize meal, after the globulins have been entirely removed, but apparently this is mainly if not wholly, an artificial product, resulting from alteration of some one or more of the preceding bodies.

12. The chief proteid in the maize kernel is the peculiar body, known as maize-fibrin or better as *Zein*, which is soluble in warm dilute alcohol, but insoluble both in water and in absolute alcohol. Zein is characterized by a high content of carbon, by its resistance to the action of dilute alkalies (i. e., non-convertibility into alkali-albuminate) and by the ease with which it is converted into an insoluble modification on being warmed with water or with very weak alcohol.

Soluble zein and its insoluble modification have the same chemical composition, as indicated by the following analyses:

	SOLUBLE ZEIN. Average of six analyses.	INSOLUBLE ZEIN. Average of three analyses.
Carbon	55.28	55.15
Hydrogen	7.27	7.24
Nitrogen	16.09	16.22
Sulphur	0.59	0.62
Oxygen	20.77	20.77
	100.00	100.00

OBSERVATIONS ON THE GROWTH OF MAIZE CONTINUOUSLY ON THE SAME LAND.

In 1888* this Station studied the effect of distance of planting on the quality and quantity of the maize crop.

In 1889† the experiment was repeated on the same land.

In 1890‡ the Station studied the comparative effects of planting in hills and drills on the quality and quantity of the maize crop, using for the test the plots which had been used in the two previous years.

In 1891 the same land was planted to maize for the fourth season in order to observe the yield from year to year when grown continuously on the same land; contrasting the crops grown with heavy applications of manure or of fertilizer chemicals with those grown where no fertilizer of any kind was applied.

Following is a record of the results for the first year. These do not require discussion till further data accumulate. It is hoped the experiment may be carried on for a considerable number of years.

Arrangement of the Field.

The accompanying diagram will make clear the arrangement of the field in 1891 and its division into strips.

The whole piece was divided into strips identical with those figured in the Report of 1890, page 184. They are four in number running from north to south, and each one containing three-tenths of an acre. They will be referred to as Plots A B C and D.

South.

Plot A.—Cow Manure at the rate of 10 cords per acre.

Plot B.—Hog Manure at the rate of 13½ cords per acre.

Plot C.—Fertilizer Chemicals at the rate of 1700 pounds per acre.

Plot D.—No manure or fertilizer of any kind.

North.

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[*] Report Connecticut Experiment Station, 1889, p. 9.

[†] Report Connecticut Experiment Station, 1889, p. 219.

[‡] Report Connecticut Experiment Station, 1890, p. 184.

Fertilizers and Manure used.

In the years 1888 and 1889 the same commercial fertilizer was applied on all the Plots and the quantity of crop removed was practically alike on all.

In 1890, Plot A received 20,925 pounds or 3.2 cords of cow manure, which is at the rate of 10.7 cords per acre.

Plot B received 21,141 pounds or 4 cords of hog manure which is at the rate of 13.3 cords per acre.

Plot C received a mixture of chemicals consisting of 100 pounds of nitrate of soda, 80 pounds of sulphate of ammonia, 80 pounds of dried blood, 125 pounds of cotton seed meal, 90 pounds dissolved bone black, and 40 pounds of muriate of potash, which is at the rate of 1700 pounds per acre.

Plot D received no fertilizers.

Analyses of the samples of manure are given on page 71, of the Report for 1890.

The following table shows the quantities of nitrogen, phosphoric acid and potash applied each year to the soil in the fertilizer and the quantities annually removed in the crops and the consequent exhaustion or enrichment of the soil. The phosphoric acid and potash in the crops of 1890 were not determined but have been assumed to have the same relation to the nitrogen of the crops as they had in the crop of 1888.

Pounds of Nitrogen, Phosphoric Acid and Potash put on in Fertilizer and taken off in Maize Crop for Three Years.

	Nitrogen.	Phosphoric acid.	Potash.
Put on each plot in fertilizer per acre in 1888	45.1	107.2	77.8
Took off in crop per acre	94.8	39.4	50.2
Gained (+), or lost (–) by the soil in 1888	–49.7	+67.8	+27.6
Put on each plot in fertilizer per acre in 1889	45.1	107.2	77.8
Took off in crop	60.9	28.7	48.5
Gained or lost by the soil in 1889	–15.8	+78.5	+29.3
Gained or lost by the soil per acre in two years' cropping	–65.5	+146.3	+56.9
Put on Plot A in cow manure per acre in 1890	293	142	209
Took off in crop per acre	114	47	60
Gained or lost on Plot A per acre in 1890	+179	+95	+149
Put on Plot B in hog manure per acre in 1890	409	569	72
Took off in crop per acre	120	50	64
Gained or lost on Plot B per acre in 1890	+289	+519	+8

	Nitrogen.	Phosphoric acid.	Potash.
Put on Plot C in mixed chemicals per acre in 1890	172	162	69
Took off in crop per acre	103	43	55
Gained or lost on Plot C per acre in 1890	+69	+119	+14
Took off in crop from Plot D which received no fertilizer in 1890	66	27	37
Lost by the soil on Plot D per acre in 1890	−66	−27	−37

If from the quantities of these ingredients added to the plots during the three years in the manure, is deducted the quantities of each ingredient taken from the land in the same time by the crops, the remainder shows how much has been added to (+) or taken from (—) the original capital of the soil by the three years' cropping, leaving out of any account at present losses by drainage or liberation of nitrogen from the soil.

Table I expresses the result in pounds per acre.

TABLE I.—ENRICHMENT (+) OR IMPOVERISHMENT (—) OF SOIL BY THREE YEARS' CROPPING.

	Nitrogen.	Phosphoric acid.	Potash.
Plot A	+113.5	+241.3	+205.9
Plot B	+223.5	+665.3	+ 64.9
Plot C	+ 3.5	+265.3	+ 70.9
Plot D	−131.5	+119.3	+ 19.9

In 1891 practically the same quantities of fertilizers were applied to each plot as in 1890.

Plot A received 20,453 pounds or 3.1 cords of cow manure, equal to 10.3 cords per acre.

Plot B received 21,721 pounds or 4.1 cords of hog manure, equal to 13.6 cords per acre.

Plot C received precisely the same chemicals as in 1890, and Plot D received nothing.

The manure was hauled and spread on April 1st and 3d. The land was plowed about the first of May, and on the 16th of May the fertilizer was sown on Plot C, and all four plots were harrowed and planted.

Planting.

With an Aspinwall planter, White Edge Dent—a variety of maize which has been raised in this farm for many years,— was put in on all four plots alike, in rows four feet apart. The stalks stood on the average 12 inches apart in the row.

Cultivation.

The crop came up well and made good growth through the season. It was cultivated with the horse cultivator three times and the weeds in the rows hoed out. Plots A and B did not differ in appearance through the season. Plot C was at first behind those above named in development, but by the end of the season the difference was not very noticeable. The crop on D was spindling and poor.

The season was very favorable for ripening corn and there was no soft corn in the field at harvest. All of it was sound though on Plot D there were many very small ears or "nubbins."

Cutting and Harvest.

On October 4th the corn was fully ripe and there had been no frost.

There were nine rows in each strip. The central row of each was cut for the laboratory sample and stacked by itself. The whole crop was cut and separately stacked on the same day.

On October 26th, the crop on each plot was weighed and husked and samples were taken to the laboratory and immediately prepared for analysis.

GROSS YIELD OF THE PLOTS.

Table II presents the gross yield of field-cured kernels, cobs and stover on the several plots.

Inasmuch as the kernels were air-dried on the cob the weight of the latter in the field-cured condition could not be ascertained. The weight therefore of the kernels in the table is slightly higher and that of the cobs correspondingly lower than it should be. But the error is insignificant.

The gross yield of kernels and of total crop on plots A and B which received a heavy dressing of manure, is practically the same; the difference being less than three per cent. The Stover on these plots differs by about six per cent. being largest on plot A where cow manure was used.

Plot C, which had received fertilizer chemicals, gave less gross yield than Plot A by somewhat more than eight per cent.

Plot D, which for two years has had no fertilizer of any kind, produced a crop weighing about sixty-two per cent. of the weight of the crop harvested from the plots which had been heavily manured for the last two years.

TABLE II.—GROSS YIELD OF THE PLOTS IN POUNDS PER ACRE.

	Plot A Cow manure.	Plot B Hog manure.	Plot C Chemicals.	Plot D No fertilizer.
Kernels	6003.8	6132.8	5688.0†	3154.6
Cobs*	697.5	717.5	665.7	431.3
Stover	6720.0	6300.0	5969.9	4710.0
	13422.3	13150.3	12323.6	8295.9

DRY SUBSTANCE OF THE CROPS IN POUNDS PER ACRE.

Since the field-cured crops contained large and varying quantities of water a strict comparison of yields can only be made on the dry substance of the crops. This comparison is as follows:

TABLE III.—DRY MATTER OF THE CROPS, POUNDS PER ACRE.

	In kernels.	In cobs.	In stover.	Total.
Plot A, cow manure	4296.3	623.8	3255.8	8175.9
Plot B, hog manure	3723.3	640.7	3235.0	7599.0
Plot C, fertilizer chemicals	2897.0†	594.5	3216.6	6708.1
Plot D, no fertilizer	2515.8	385.2	2490.2	5391.2

The total dry matter is largest on Plot A, which had been heavily dressed with cow manure for two years. The dry matter on plot B, which had a heavy dressing of hog manure for two years was a little more than nine-tenths as large, the yield of plot C,† which had received commercial fertilizers was a little more than eight-tenths as large, while that of plot D that had received no fertilizer for two years was only two-thirds as large as that of the largest yield, that is of plot A.

The yield of dry stover was practically the same on plots A, B and C. The weight of stover on plot D was a little more than three-quarters that of the others.

The greatest differences between the plots is in the yield of dry kernels. Plots B, C and D yielded respectively 86.6, 67.4, and 58.5 per cent. of the yield from plot A.

YIELD OF EACH FOOD INGREDIENT, IN POUNDS PER ACRE.

From the analyses which are given later on and from the gross weights of crops, has been calculated Table IV, which shows how many pounds of each food ingredient was harvested in the kernels, the cobs, and the stover separately and how much in all together. The cobs were not analyzed, but as their total weight was comparatively small and as their composition is not likely to vary widely, the average composition of cobs, as determined in other analyses, was applied for the calculation.

* Air dry.

† See foot note on page 145.

TABLE IV.—YIELD OF EACH FOOD INGREDIENT IN POUNDS PER ACRE.

	Plot A.				Plot B.				Plot C.				Plot D.			
	Kernels.	Cob.	Stover.	Total.	Kernels.	Cob.	Stover.	Total.	Kernels.	Cob.	Stover.	Total.	Kernels.	Cob.	Stover.	Total.
Water	1707.5	74.7	3464.2	5246.4	2409.6	76.8	3065.0	5551.4	2791.0	71.2	2753.3	*5615.5	638.8	46.1	2219.8	2904.7
Ash	60.0	9.8	194.8	264.6	52.8	10.0	184.3	247.1	37.0	9.4	164.2	210.6	32.8	6.0	126.2	165.0
Albuminoids	431.1	16.7	162.6	610.4	375.3	17.2	186.3	578.8	257.7	16.0	157.6	431.3	199.7	10.3	115.9	325.9
Fiber	49.3	210.3	1007.4	1267.0	37.4	215.9	981.0	1234.3	33.0	200.4	1005.3	1238.7	30.9	129.8	776.7	937.4
Nitrogen-free extract	3507.4	383 5	1847.3	5738.2	3043.7	393.9	1831.7	5269.3	2403.3	365.4	1848.9	4617.6	2108.9	236.8	1437.5	3783.2
Fat	248.5	3.5	43.7	295.7	214.1	3.7	51.7	269.5	166.0	3.3	40.6	209.9	143.5	2.3	33.9	179.7
	6003·8	698.5	6720.0	13422.3	6132.9	717.5	6300.0	13150.4	5688.0	665.7	5969.9	12323.6	3154.6	431.3	4710.0	8295.9

* See foot note on page 145.

The production of each food ingredient was greatest on Plot A, least on Plot D.

There was more water in the harvested crop on Plot C than in that of any other plot.*

While the albuminoids make up 7.47 and 7.61 per cent. respectively of the whole dry matter of the crops on Plots A and B they make only 6.05 per cent. of the crop on Plot D.

The crops on A and B are therefore richer in albuminoids, as well as larger than on the other two plots.

DIFFERENCES IN CHEMICAL COMPOSITION OF CROP CAUSED BY DIFFERENCES IN FERTILIZATION.

Table V gives the analyses of the kernels and stover from the four plots both in the field-cured and water-free condition. The latter best serves for comparison.

Fat and Fiber.—There are no striking differences in the per cent. of these ingredients in the crops from the different plots.

Ash.—The per cent. of ash in the kernels from the several plots is practically the same; in the stover it is noticeably lower on Plots C and D.

Nitrogen-free Extract.—(Starch, Sugar Gum),—is one per cent. higher in the kernels from Plot C and two per cent. higher in those from Plot D, than in kernels from Plots A and B.

TABLE V.—ANALYSES OF FIELD-CURED MAIZE KERNELS AND STOVER FROM PLOTS A, B, C, D.

Plot.	Analyses of Field-cured Maize.						Analyses. Calculated Water-free.				
	Water.	Ash.	Albuminoids.	Fiber.	Nitrogen-free Extract (starch, gum, etc.)	Fat.	Ash.	Albuminoids.	Fiber.	Nitrogen-free Extract (starch, gum, etc.)	Fat.
Kernels.											
A	28.44	1.00	7.18	.82	58.42	4.14	1.42	10.05	1.15	81.60	5.78
B	39.29	.86	6.12	.61	49.63	3.49	1.42	9.98	1.02	81.81	5.77
C	49.07*	.65	4.53	.58	42.25	2.92	1.26	8.89	1.15	82.97	5.73
D	20.25	1.04	6.33	.98	66.85	4.55	1.30	7.95	1.23	83.83	5.69
Stover.											
A	51.55	2.85	2.42	15.04	27.49	.65	5.88	5.02	30.97	56.76	1.37
B	48.65	2.93	2.96	15.57	29.07	.82	5.70	5.76	30.32	56.63	1.59
C	46.12	2.75	2.64	16.84	30.97	.68	5.10	4.90	31.26	57.47	1.27
D	47.13	2.68	2.46	16.49	30.52	.72	5.07	4.66	31.13	57.77	1.37

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* The per cent. of water in the kernels from Plot C is so much higher than that in the kernels of either of the other plots or than has ever been found in field-cured maize from this locality that an error in weighing or recording the weight of the subsample of kernels is strongly suspected. This cannot now be detected or remedied. Therefore there is reason to doubt in case of the kernels from Plot C, the correctness of the figures for gross yield, for dry matter, water, and all the other ingredients and the analysis in the field-cured condition. This affects only the kernels on Plot C. The water-free analysis is not affected.

Most interesting are the differences in the per cent. of protein in the kernels, that portion of the plant which is regarded as most constant in composition.

The dry matter of the kernels from Plots A and B, the heavily manured plots, contained in round numbers one per cent. more protein than the kernels from Plot C* which received commercial fertilizers and two per cent. more than those of Plot D which had no fertilizer.

On plots which received an excess or an abundance of available plant food, the kernels in the crop were decidedly richer in albuminoids and less starchy than on plots which were relatively deficient in plant food.

Quantities of Nitrogen, Phosphoric Acid and Potash applied in the Manure or Fertilizer and Removed by the Crop.

The manure used, which was made from the same kind of feed and of animals as in 1890, was not analyzed again in 1891 but was assumed to have the same composition as in the previous year.

In Table VI are given, first, the total quantities of nitrogen, phosphoric acid and potash which have been applied to the land in the years 1888, 1889 and 1890 in excess of the quantities removed by the crops of those years, second, the quantities applied in 1891, third, the quantities removed by the maize crop of 1891 and fourth, the quantities of these ingredients added in four years in excess of what was removed by the four crops, marked [+], or the quantities of each removed by the crops in excess of what was supplied in fertilizers, marked [—].

The larger quantity of phosphoric acid and smaller quantity of potash in excess on Plot B as compared with A is explained by differences in the feed of the cattle which made the manure used. The cows ate large quantities of hay and stover, relatively rich in potash while the hogs had phosphates in the bones which came in garbage, but potash in the food was relatively small in quantity and it may be that the slightly smaller yield in 1891 of Plot B was caused by a relative deficiency of potash.

So heavy an application as 4.1 cords per acre of this hog manure while supplying nitrogen and phosphoric acid in very great excess of the quantity which the crop removes supplies only a small excess of potash, less than eight pounds.

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* See foot note, page 145.

TABLE VI.—ENRICHMENT OR IMPOVERISHMENT OF SOIL BY FOUR YEARS MANURING AND CROPPING.

	Cow Manure. Plot A.			Hog Manure. Plot B.			Fertilizer Chemicals. Plot C.			No Fertilizer. Plot D.		
	Nitrogen.	Phos. acid.	Potash.	Nitrogen.	Phos. acid.	Potash.	Nitrogen.	Phos. acid.	Potash.	Nitrogen.	Phos. acid.	Potash.
After three years' cropping	+113.5	+241.3	+205.9	+223.5	+665.0	+64.9	3.5	+265.3	+70.9	−131.5	+119.3	+19.9
Applied in 1891	286.3	136.4	204.5	419.9	586.5	72.4	172.0	162.0	69.0	00.0	00.0	00.0
Taken off in Crop of 1891	97.7	37.5	79.9	92.7	31.6	65.0	69.3	23.5	47.7	52 1	22.2	30.7
Leaving in excess (+) or deficiency (—) after four years' cropping	+302.1	+340.2	+330.5	+550.7	+1219.9	+72.3	+106.2	+403.8	+92.2	−183.6	+97.1	−10.8

The relative proportions of phosphoric acid, potash and nitrogen in the average maize crop and in the cow manure and hog manure made on this farm are as follows:

	Phosphoric acid.	Potash.	Nitrogen.
Average maize crop	1	1.6	2.4
Cow manure	1	1.9	2.7
Hog manure	1	.12	.72

That is, for every pound of phosphoric acid removed by the crops, 1.6 pounds of potash and 2.4 pounds of nitrogen are also taken. With every pound of phosphoric acid applied in cow manure, 1.9 pounds of potash and 2.7 pounds of nitrogen are applied; the ratio being quite nearly the same as in the crop.

But if enough hog manure is applied to cover the nitrogen which is to be removed in the crop, there will also be applied about three times as much phosphoric acid but only one-third as much potash as the following crop will remove.

Of course in crop rotation as usually practiced, the crop residues and unused manure remaining in the soil as well as the natural capacity of the soil itself, are taken account of in manuring for the next crop.

Yields of "Shelled Corn," and Percentage Composition of Dry Matter for Four Years.

Table VII shows the largest crops of dry matter, reckoned to the acre, which were harvested in 1888 and 1889 and their percentage composition, together with all crops from drills in 1890 and from Plots A, B, C, D in 1891 calculated to an acre. The rows were four feet apart in all four years.

The plots marked A were on cow manure, B were on hog manure, C on commercial fertilizers, and D had no fertilizer in the years 1890 and 1891.

As it is customary to judge of a maize crop by the yield of "shelled corn" in bushels, the yields have also been calculated in this way with the results given in the fourth column of the table. In this calculation twenty per cent. has been added to the weight of water-free kernels for the water in corn cured enough to shell and 50 pounds has been assumed as the weight of such shelled corn per bushel.

TABLE VII.—YIELD OF DRY MATTER AND "SHELLED CORN" PER ACRE FOR FOUR YEARS AND PERCENTAGE OF DRY MATTER.

					Percentage Composition of Dry Matter				
	Year.	Distance of Planting.	Yield of Dry Matter per Acre.	Bushels of Sound, Shelled Corn.	Ash.	Albuminoids.	Fiber.	Nitrogen-free Extract.	Fat.
Fertilized alike	1888	Stalks 12 inches apart,	7350	75	3.3	7.8	19.4	66.1	3.4
	1888	" 6 " "	7980						
	1889	" 12 " "	6144	60	3.5	6.1	21.7	69.7	3.0
	1889	" 6 " "	6352						
On Cow Manure	1890A	" 10 " "	9014	91	4.0	7.9	19.8	65.7	2.6
On Hog Manure	1890B	" 10 " "	9436	97	4.2	8.0	19.6	65.5	2.7
On Fertilizer Chemicals	1890C	" 10 " "	8070	87	3.9	8.0	21.2	64.4	2.5
No Manure or Fertilizer	1890D	" 10 " "	6626	51	3.8	6.2	20.7	66.7	2.6
On Cow Manure	1891A	" 12 " "	8176	103	3.2	7.5	15.5	70.2	3.6
On Hog Manure	1891B	" 12 " "	7599	89	3.3	7.6	16.2	69.3	3.6
On Fertilizer Chemicals	1891C	" 12 " "	6708	70	3.2	6.4	18.5	68.8	3.1
No Manure or Fertilizer	1891D	" 12 " "	5391	60	3.1	6.0	17.4	70.2	3.3

FURTHER RESULTS FROM THE APPLICATION OF FUNGICIDES TO PREVENT THE "SPOT" OF QUINCE (*Entomosporium maculatum.*)

By Dr. Roland Thaxter.

In the last report of the Station (1890) photo-reproductions were given showing the beneficial results of treatment with Bordeaux mixture for the leaf-spot of quince in the orchard of Mr. Geo. F. Platt at Milford, as compared with portions of the same orchard which received no treatment, the rows in the one case having retained their foliage intact till the last of October, while the untreated rows beside them lost their leaves by the end of summer. Owing to the injury done by the fungus in previous years no fruit set in 1890, even on the treated rows, a natural result of successive defoliation, and it was suggested in the report just referred to that a second season's treatment would have an additional interest in connection with the comparative set of fruit on the rows treated and untreated during the previous year. That the effect was strikingly in favor of the treatment, may be seen by reference to the photo-reproduction of single treated and untreated rows reproduced from photographs taken about September 20th, as well as by the figures which will be given presently.

At the time of blossoming, in May of the present year, the treated rows were conspicuous from a distance by the much greater body of bloom upon them, and it may be mentioned that the two rows which had received Bordeaux mixture showed a decided superiority in this respect over those treated with carbonate of copper.

The first treatment of the season was given just as the first blossom buds were opening, and in all the applications the two Bordeaux-mixture rows were sprayed with the same strength of the mixture which was employed during the season of 1890 (6 lbs. sulphate of copper, 4 lbs. of lime, to 25 gallons of water). On the two remaining rows that were treated, a precipitated carbonate of copper was used in place of the ammoniacal solution employed in 1890, about three pounds of sulphate of copper being precipitated from concentrated solution with carbonate of soda, and then diluted to twenty-five gallons with water.

The first application was made May 11, the second May 28, and the third *and last* June 22. Owing to the unusually dry summer a fourth application was unnecessary, the Bordeaux mixture adhering so firmly that it was conspicuous on the leaves late in September.

The rows treated with Bordeaux mixture set an abundant yield of fruit, in most cases as much as the tree could properly mature, while the other two treated rows set a much smaller amount. The "set" of the untreated rows was very small, and at the time of harvesting the relative yield of *marketable* fruit was as follows:

	Marketable fruit.
Two rows sprayed with Bordeaux mixture in 1890–91	71½ baskets.
" " " " ammoniacal carbonate of copper in 1890, and with precipitated carbonate of copper in 1891	7 "
Five rows untreated in 1890–91	1 "

The superiority of the fruit from the rows sprayed with Bordeaux mixture as compared with that from the other treated rows in regard to the *quality*, was quite remarkable. While the yield from the carbonate of copper rows was very fair as regards quantity, the fruit was so badly injured by the spot and more especially by being "wormy," that only the very small quantity of fruit above stated was found to be marketable. The apparent effectiveness of the Bordeaux mixture in keeping off the quince "maggot" suggests the advisability of using an insecticide with the fungicide in the first two treatments as is often done in spraying for the codlin moth and apple scab. If Paris green is used it should be mixed to a smooth paste with a little water, and then stirred into the Bordeaux mixture in the proportion of one pound of Paris green to 100 gallons of mixture.

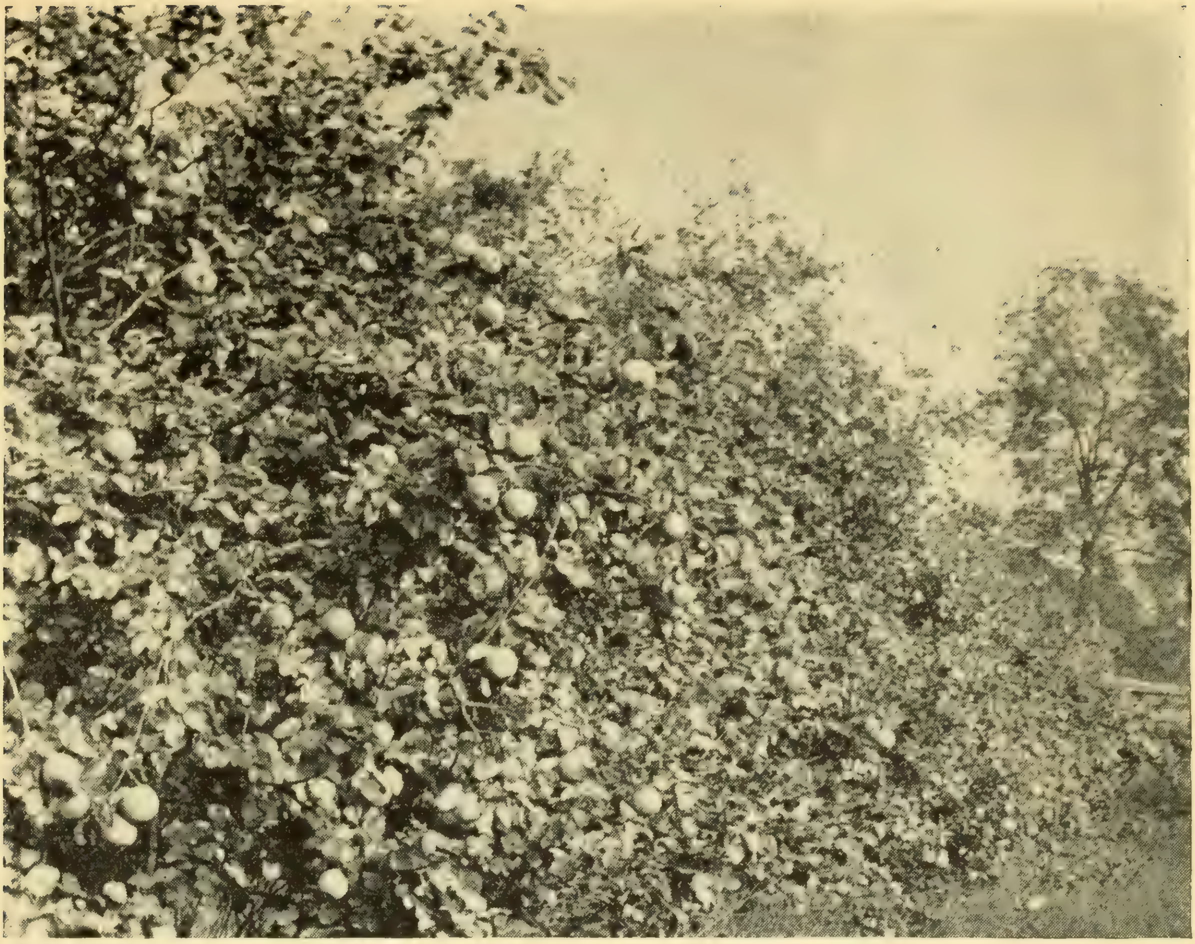
The application of the fungicide in the present case was made much more effective than in the previous year, and a perfectly even distribution of the material ensured by means of a plunger, which was worked in the barrel by the person who pumped. This consisted of a broom-stick with a short piece of board screwed on the end and was worked through a small hole bored in the top of the barrel. Such a contrivance, the details of which need not be dwelt upon, gives the most satisfactory results for rapid and complete stirring, and is indispensable for good work.

It was found that a second or third stream turned into the barrel was either utterly ineffectual in practice, or interfered too seriously with the working of the nozzles if it was made large enough to do its work with any thoroughness.

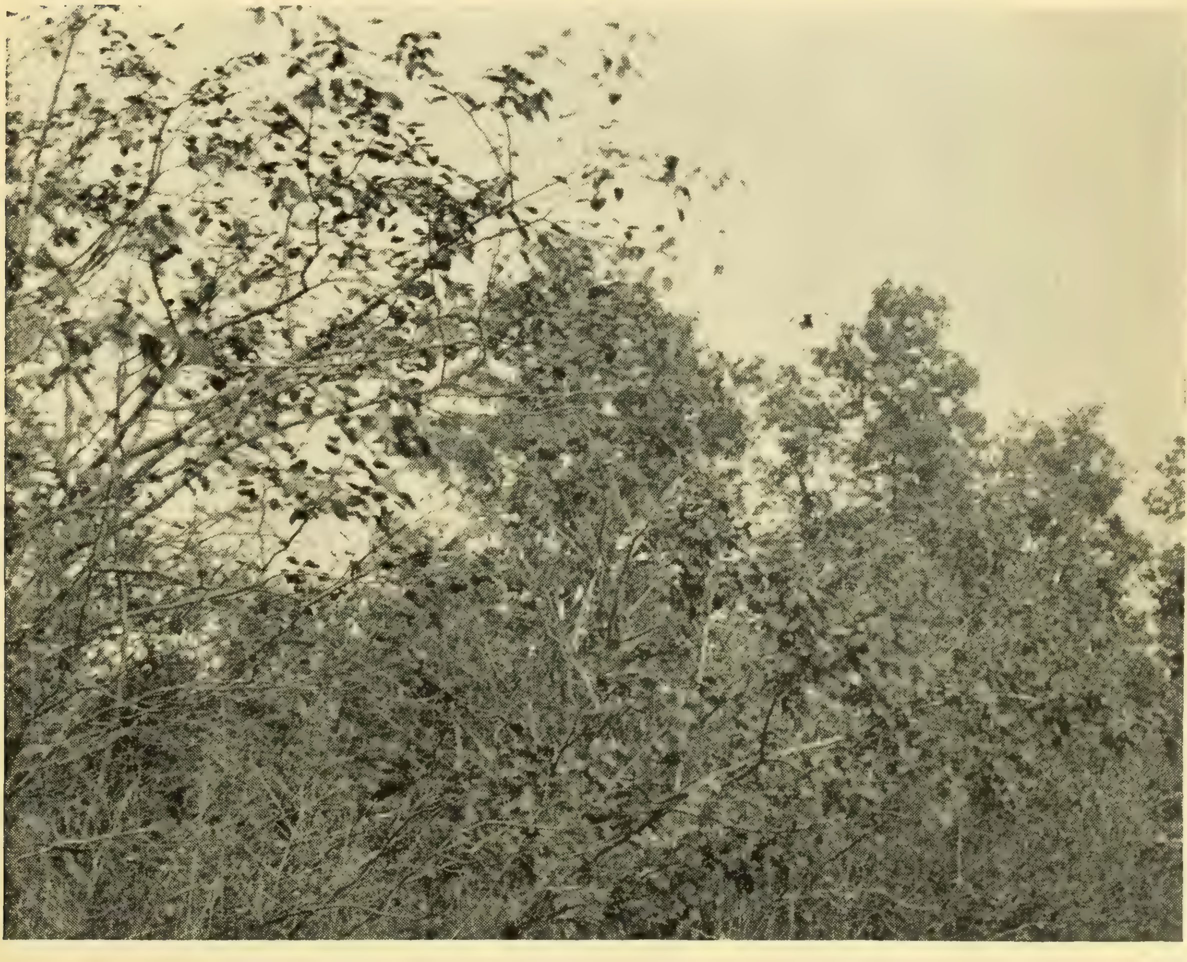
The cash account with the two rows treated with Bordeaux mixture is about as follows :

Dr.	
To 3 men and team 3 hours	$1.80
To 36 lbs. sulphate of copper at 6c.	2.16
To 24 lbs. lime at 1 c.	.24
	$4.20
Cr.	
To 71½ baskets of first-class fruit at .75	$53.62
Balance above expenses	$49.42

Comparing the yield from the untreated rows and estimating it at ⅓ basket per row, which is more than was actually obtained, the net income from a single treated row was one hundred times as great as from an untreated row.



Quince Orchard showing result of Spraying with Bordeaux Mixture, 1891.



Adjacent row showing result of no treatment.

POTATO SCAB.

By Dr. Roland Thaxter.

Since the publication of the report of the Station for 1890, in which the cause of the above disease was described in some detail and referred to the action of a peculiar fungus as yet unnamed, experiments on the subject have been continued at the Station and elsewhere, which fully corroborate the conclusions reached in regard to the causation of the disease. Cultures and infections under test conditions, similar to those described in the report referred to, were repeated in the green-house with similar results and demonstrated beyond question that the fungus and the disease are directly connected as cause and effect. Observations in the field in Connecticut as well as in other New England States, have also satisfied the writer of the correctness of this view, the fungus being easily demonstrated in every case examined, and visible to the naked eye in all freshly dug tubers affected by the disease in question.

It should be remarked that no condition of the disease, whether deep-seated or superficial, was found without this accompanying growth, and the season's observations in this respect have led the writer to believe that the supposed types of the disease previously referred to as "deep" and "surface" scab are really variations, merely, in the action of the same agent, which might be readily attributable to various physiological or other causes. This view is also supported by further observations which will be referred to presently ; but it is still possible that the writer has never encountered the surface form in nature and that the apparently invariable occurrence of the fungus may be thus explained.

Through the kindness of Prof. Arthur the writer received a small lot of tubers from La Fayette, Ind., affected by the same form of the disease recently studied by Prof. Bolley and pronounced by him to be of bacterial origin. Unfortunately plate cultures were not made from these specimens; but all were planted in clean ground in which undiseased tubers planted at the same time yielded a practically clean crop. The La Fayette tubers, however, yielded from the eleven hills planted, 50 per cent. of scabbed tubers, on every diseased spot of which the fungus was apparent to the naked eye.

Prof. Arthur also writes me that he has isolated the scab fungus at La Fayette from tubers grown in that vicinity, and Prof. Bolley himself has found no other cause associated with the disease as it occurs in North Dakota, his present station. In a recent bulletin upon the subject (Bulletin No. 4, N. Dakota Experiment Station, Dec., 1891), Prof. Bolley remarks that "The first cause of deep scab as studied here is found to be a plant organism of very minute character which attacks the surface of young growing tubers, eroding, irritating and blackening the adjacent tissues, and is identical with that associated with the disease in the East (Thaxter l. c.)," also that "Pure masses of the scab plant grown upon nutrient gelatine as seen in Fig. 1, free from all other germs, when transferred to the surface of healthy growing potato tubers, will invariably produce the disease at the point of application."

The writer's results are thus strikingly confirmed by observations made in a widely different locality as well as by the additional experiments, already referred to, which have been made at this Station, and there seems little doubt as to the true origin of the disease, as it occurs in this vicinity.

Prof. Humphrey informs me that the supposed bacterium of scab was isolated by Prof. Bolley from material received from Amherst, Mass., and pronounced by the former observer to be identical with the La Fayette form. If two distinct diseases really exist, therefore, they should be more or less widely distributed in New England as well as in the Western States. As already mentioned, however, the writer is inclined to believe that there is no essential difference between the two as to cause at least. But since Prof. Bolley is in a better position to judge concerning this matter from his more extended acquaintance with the La Fayette form, I take the liberty of quoting from his bulletin already referred to, merely remarking that I am inclined to agree with his suggestion that the so-called bacterium of scab is merely an accompaniment and not a cause of the disease, and probably only partially (if it is at all) parasitic in a state of nature.

"As to the question whether two distinct diseases exist, I may say that I am even yet much in doubt. This would at first glance seem to imply that I doubt the accuracy of my last year's infection tests. This is, however, in no wise necessarily so, as various other circumstances are involved which render such an assumption on my part as yet comparatively groundless. Certainly, in common with those conversant with the details of such work, I recognize that there are many possibilities of error; but that work was too carefully done to admit of any change in the assertion made in the report of the same (Agricultural Science, loc. cit.) other than in so far as they assume only one form of the disease, a point which with me must remain in doubt until I shall have been able to do work under conditions similar to those under which the work was then carried out. The organism with which I then worked, a true bacterium, was undoubtedly very different from that pointed out by Dr. Thaxter, as the originator of "*deep scab*," the one which upon coming to Dakota I was immediately and readily able to recognize as the active agent in the disease here. Furthermore, in so far as cultural and infection tests have been conducted this year, affirmative results have been attained only with the latter form, the bacterium not being found. I have, however, to that end, to date, used only the disease as found here, a form very much more pronounced than that studied last year, possessing some characteristics of action not then noticed. How many of these were present but not then noticed, and how much they are due to soil differences, I cannot say. Certain it is that it is hard to draw the line between a *surface* and a *deep* form of the disease from a consideration only of gross characters, unless it be in the point of a pink coloration of the surrounding living tissues not then noticed.

That, in the Indiana work, I many times under apparent exclusive infection conditions, induced potato scabs, recognized as such by all who saw them, there is no question. Considering then for the time that the disease as generally understood has but one origin, there are two possible ways for accounting for those results: *First*—Error in formation of the infection material so that other germs than the bacterium were present (possible but not probable). *Second*—That the bacterium used (which was undoubtedly parasitic in the potato plant) might under the conditions of the inoculations produce the scabbing which in nature would not occur. This I deem very probable from the then determined capabilities of the bacterium to penetrate living tissues of the potato plant even to parts of young growing stems. The question is yet an open one. I can only regret that my authentic material was unavoidably lost and await opportunity to give it further test. I may say, however, that the parasite studied this year acts much more rapidly in artificial infection than did the bacterium, and there is little question that it is the originator of the chief amount of damage done by potato scab." (Bolley, l. c.)

The experiments made at this Station during the present year consisted in a repetition of the artificial infection of growing tubers in the green-house, with pure scab fungus grown on potato agar and transferred to definite areas in the form of letters, etc., as described in my former report. But since they merely confirm the conclusions already stated in the report just mentioned, it is superfluous to describe them in detail. It may, however, be mentioned that in connection with these inoculations an attempt was made to produce an effect upon growing tubers by means of the fungus spoken of in my previous report (p. 17 note) and doubtfully referred to *Oospora perpusilla* by Prof. Saccardo. Pure cultures of this fungus were obtained from horse dung on which it always appears as a whitish coating, but when transferred to the potato tubers no effect whatever was produced.

Two small field experiments were also tried upon the Station grounds. The first of these was intended to test the effect, if any, of sulphur and of muriate of potash used as a fertilizer in the hills, upon the amount of scab produced in tubers grown on land known to be infected. The experiment was without result, no difference being found between the hills thus treated and the alternate hills untreated, the tubers being very generally scabbed in all cases.

A second experiment was tried on a piece of new land, also on the Station grounds, the sod of which had not been turned for a period of years. On this land 178 hills were planted as follows :

Set a.—28 hills; planted with scabbed seed known to be attacked by the scab fungus, every second hill unfertilized, the rest fertilized with mixed fertilizer.

Set b.—28 hills, planted with clean Beauty of Hebron seed. Every second hill unfertilized, the rest fertilized with manure from horse fed on hay and oats.

Set c.—28 hills, planted as in *set b*, but every second hill fertilized with manure from horse fed on oats in which pure cultures of the scab fungus had been mixed.

Set d.—14 hills, planted as in *b* with addition of a trowel full of oxide of iron in the alternate hills, every second hill fertilized with mixed fertilizer.

Set e.—14 hills, planted as in *b*, the alternate hills containing broken plaster and cement, the rest mixed fertilizer.

Set f.—22 hills, every other row planted with scabbed seed from La Fayette (unfertilized), the rest as in *Set b*, unfertilized.

Set g.—28 hills, planted as in *b*, the alternate rows fertilized with wood ashes, the rest with commercial fertilizer.

The potatoes were dug July 28, with the following results:

Set a.—66½	per cent.	scabbed	badly in all hills.	
Set b.—5	"	"	in hills containing	manure.
9	"	"	" "	commercial fertilizer.
Set c.—50	"	"	" "	manure.
3½	"	"	" "	commercial fertilizer.
Set d.—8	"	"	" treated with oxide of iron.	
2	"	"	in alternate hills.	
Set e.—60	"	"	in hills containing plaster, etc.	
6	"	"	in alternate hills.	
Set f.—50	"	"	in hills containing La Fayette seed.	
4	"	"	in alternate hills.	
Set g.—7½	"	"	in hills containing wood ashes.	
12½	"	"	in alternate hills.	

As far as so small an experiment is of value the results seem to show that in clean land in which about six per cent. only of the crop of potatoes would be normally scabbed, (1) scabbed seed very greatly increases the number of diseased tubers produced, (2) that barn-yard manure which has not been contaminated by the scab fungus, either by food ingested or otherwise, *may* not materially increase the amount of scab, (3) that oxide of iron in amount sufficient to color new tubers red exerts no appreciable influence on the amount or virulence of scab, (4) that plaster and cement, for some reason not apparent, exercises a very decided influence, especially upon the virulence of the disease, which was worse in these hills than in any others, (5) that wood ash has no apparent connection, as has been suggested, with the presence of the disease.

Although the hills fertilized with barn-yard manure from a horse fed with pure culture of the scab fungus, show a decided increase in the amount of scab, the experiment can hardly be considered a fair one, as the cultures in question consisted almost wholly of the vegetative mycelium of the fungus, so that comparatively few spores were ingested, and the purely vegetative hyphæ may have been killed in the digestive tract, such spores as were present alone surviving, and perhaps multiplying only to a limited extent in the fæces after evacuation. The reverse would be true where scabbed potatoes, on which the spore formation is always very abundant, were fed to stock, and the writer is convinced that the practice of feeding diseased tubers in this way is one of the most important means by which the disease is spread on farms. In view of the well-known fact that great numbers of fungus spores can and do pass through the digestive tract without injury, and that the scab fungus is known to grow luxuriantly in decoctions of horse or cow dung, it is not unreasonable to assume that its spores, passing through the digestive tracts of stock fed with diseased potatoes, continue their development in the manure after evacuation, and thus afford the means of wide-spread infection on land fertilized with such material.

The condition of the hills treated with plaster and cement was very striking; the scabs upon the tubers being unusually deep and widespread and the grey appearance produced by the fungus very conspicuous. The reason for the apparent stimulus which these substances seem to exert on the growth and spread of the fungus is not easily explained, and further experiments should be made to ascertain whether or not the results obtained were accidental.

The theory entertained by many persons in the State, that scab originated with the use of wood ashes as a fertilizer, is certainly in no way supported by the results obtained, and it is moreover quite improbable that so thoroughly sterilized a substance should be a medium of infection.

In regard to the question of prevention by treatment little can be said. Prof. Bolley in the Bulletin referred to, gives the results which he obtained by treating the seed potatoes in various ways in order to kill the fungus upon seed tubers before planting: but the use of clean seed would seem to be a simpler and more effectual means of avoiding infection of this nature. The application of any substance to the vines is manifestly absurd in view of the nature and action of the disease, and it seems extremely doubtful whether any advantage would be gained by treating the seed and adjacent earth with Bordeaux mixture (as claimed in a recent bulletin of the Rhode Island Experiment Station) or with any other substance.

Certain preventative measures may, however, be taken with great advantage.

(1.) The seed must be free from any scabs.

(2.) Land which has produced scabbed crops in previous years either of potatoes or of beets or has been fertilized with manure from scab-fed stock must not be planted to potatoes.

(3.) Scab potatoes should never be fed to stock under any circumstances, unless they have been thoroughly cooked, even if the land on which the manure is to be used is not to be cropped with potatoes at once.

(4.) In general any fertilizer is to be preferred to barn-yard manure for potatoes, whether the stock has been fed with diseased potatoes or not.

(5.) If it is suspected that a crop is scabbed *it is of great importance to dig the potatoes as soon as possible* after they are mature, since the scab spots increase in size and deepen as long as they are left in the ground and what is at first a comparatively slight surface injury may be sufficiently extended to render tubers worthless which would otherwise have been marketable.

In regard to the botanical relations of the fungus producing scab, it has already been stated that the form appears to be undescribed, and since a definite designation seems desirable for the agent of so important a disease the following diagnosis may be given.

Oospora scabies, nov. sp.

Vegetative hyphæ brownish .06–1 μ in diameter, curving irregularly, septate or pseudoseptate, branching. Aërial hyphæ at first white, then grey, evanescent, breaking up into bacteria-like segments after having produced single terminal spiral spores (?) by the coiling of their free extremities. Forming a firm lichenoid pellicle on nutrient jelly and usually producing a blackish-brown discoloration of the substratum on which it grows, causing the disease known as "scab" on potato tubers, and a similar disease of beet roots (sec. Bolley).

The fungus is referred to Oospora merely for the reason that it appears more nearly allied to certain forms included in this genus by Saccardo, than any others known to the writer. There seems to be, however, at least one, perhaps several saprophytic forms, having the same morphological characters, which may prove constant enough to warrant a new generic designation. The white "efflorescence" which appears on horse dung soon after it is placed in a moist chamber, is almost identical with the scab fungus, and similar forms are constantly met with especially in transfers to plate-cultures from all sorts of substances. It is needless to remark that the genus Oospora, as given by Saccardo, has no scientific value, and the reference of a form to this genus is merely, as in the present case, a confession of ignorance concerning its true position.

It is to be hoped that observers in Europe may be induced to examine the disease as it occurs there, in the light of the writer's observations, and substantiate or disprove the conclusions reached as far as concerns the European form of the disease. The fungus is unusually easy to isolate by plate-cultures of potato agar or gelatine, on account of its blackening effect upon the substratum, so that its presence or absence even in old scabs is readily ascertained. One precaution only is necessary, namely, that the material for culture be taken from near the surface of the tuber, or at least not from the deeper tissues which may be invaded only by bacteria that have followed the attack of the fungus, and extended its injury.

THE CONNECTICUT SPECIES OF GYMNOSPORANGIUM (CEDAR APPLES).

BY DR. ROLAND THAXTER.

So much has been written in popular and scientific literature concerning the so-called Cedar Apples and their connection with the production of certain rusts on fruit trees and elsewhere, that it is unnecessary here to give more than a general statement of the facts which should by this time be familiar to agriculturalists generally or at least to fruit growers who are directly interested in the matter. The general facts referred to are as follows. Towards the end of spring, usually in early May, and during rainy weather, the fungus which produces the well-known distortions (cedar apples) just mentioned, protrudes from them in the form of orange-colored gelatinous masses, the orange color being chiefly due to vast numbers of fungus spores formed on the surface of these masses, and known as *teleutospores*. These teleutospores germinate rapidly, without becoming detached from the swollen masses, and give rise each to a number, sometimes as many as a dozen, small secondary spores which are discharged into the air from the sides of short threads protruding from them at various points. These secondary spores (*sporidia*) falling into the air are blown to apple or quince trees or some other plant of the same family, and adhering to the surface of the tender leaves or shoots germinate in their turn, and entering the plant tissues produce in and upon them the second or rust condition of the fungus, known as the *Roestelia* stage. The rust first shows itself as an orange or yellow spot on the upper side of a leaf for instance, in which cavities are formed producing certain bodies (*spermatia*) of unknown function, while subsequently after a period of time varying in different species from ten days to three or even four months the Roestelia appears in the form of tooth-like projections from the under side of the same spot. These projections contain great quantities of spores which are discharged into the air, and blowing back to the cedars and germinating upon them enter their tissues and give rise to new cedar apples which again reproduce the rust and so on.

The object of the present paper is to call attention to experiments which have been carried on at this Station in regard to the relations of the different species of cedar apples to the various forms of rust or Roestelia which they produce, and more especially to the development of the so-called "bird's nest" Gymnosporangium, the characteristic distortions of which are so familiar as to need no further description. Although so common a species, the experiments and observations of the writer have demonstrated that it has been hitherto undescribed, owing to various confusions which need not here be dwelt upon, and the appropriate name *nidus-avis* (bird's nest) is here proposed to distinguish this characteristic and strictly American form. The interest in the subjoined account is therefore rather scientific than economic, except in so far as it enforces the already well-known fact that to avoid certain rusts which are often serious on apple, quince or pear trees as well as on hawthorn used for ornamental or other purposes, and several related plants, it is necessary to cut down adjacent cedars as far as is practicable; for although it has been shown that infection from cedars may take place at a distance of eight miles, the virulence of the disease is of course proportionate to the proximity of the cedars.

We have in Connecticut, so far as is now known, seven distinct species of Gymnosporangium; two upon the white or swamp cedar (*Cupressus thyoides*), neither of which are economically important, one peculiar to the common juniper (*Juniperus communis*), three upon the red cedar (*J. Virginiana*), and one occurring on both the last named plants; the last five species all possessing more or less economic interest, from the rusts which they are likely to produce. The writer has continued experiments on all these species for the past five years, and has succeeded by artificial cultures under test conditions in connecting all but one of them (*Gymnosporangium Ellisii*) with its proper rust, making at the same time a critical study and comparison of the different forms and stages. In a paper on the subject published in the Botanical Gazette (Vol. xiv, No. 7) attention was called (p. 169 and 172, note) to the fact that the so-called bird's nest Gymnosporangium of the red cedar, which had hitherto been confused with another American (*G. clavipes*) as well as with a European species (*G. conicum*), was shown by cultures made at this Station and at Cambridge as well as by observations made in the vicinity of New Haven, to be a distinct and peculiarly American form as above stated.

In regard to the remaining species of Gymnosporangium it may be mentioned in passing that the experiments performed by the writer before he became connected with this Station have been repeated here in the case of *G. macropus*, *G. globosum*, *G. biseptatum*, and *G. clavariaeforme*, the failure of cultures with *G. Ellisii* on the two occasions when they were attempted, having been directly traceable to the use of teleutospores which were not in good condition for cultures, the species not being readily obtainable in a fresh state. In the case of *G. macropus*, *G. clavariaeforme* and *G. biseptatum* results were obtained identical with those previously published by the writer, while in the case of *G. globosum* certain additional facts were ascertained; namely that perhaps the most common orange rust of apples in this state is undoubtedly caused by this species. This rust, which has been referred to in previous papers as "*lacerata z*," was induced by inoculation with sporidia from *G. globosum* on three seedling russets, the inoculation being made in the greenhouse by forcing the cedar apple as well as its host so early in the spring that all possibility of accidental mixture was avoided. Spermogonia appeared the first week in April, the infection having been made late in March, and perfect and typical aecidia were developed early in July. In addition to the cultures of *G. globosum* which were made on these apples, two plants of the mountain ash (*Pyrus Americana*) were inoculated with the same Gymnosporangium in April, and having produced luxuriant spermogonia gave abundant and well developed aecidia late in July. It may be mentioned in passing that these aecidia were *not* the *Roestelia cornuta* which occurs on the same host further north, but had all the characters of the Roestelia which follows inoculation by *G. globosum* on other hosts. In addition to the above facts it was ascertained that a rust of quinces and of Keiffer pears both hitherto unrecorded hosts for this species, was referable to the same source. Cultures of *G. globosum* on Hawthorn (*Crataegus crus-galli*) were also repeated and produced abundant and well developed aecidia under equally strict conditions, confirming the writer's previous statements in all respects.

Returning to the "bird's nest" Gymnosporangium, infections with this species have been made by the writer every year since the spring of 1886, in order to determine definitely the true character of the rust which it produced, and the results in all the cultures were identical, as to the mode and rapidity of development and gross as well as microscopic characters. Until 1889, however, this rust had never been recognized in nature; but as soon as search was made for it in the light of the results artificially obtained, it was found in abundance near the Station and elsewhere in the State growing on Quince, but most luxuriantly on the Service berry (*Amelanchier Canadensis.*) Owing to its rapid development, the Roestelia matures by the first of June, simultaneously with the Roestelia of the juniper Gymnosporangium (*G. clavariæforme*), and since the two rusts inhabit both the above-mentioned host plants, they often occur together side by side on the same leaf, shoot or berry. For this reason although the two are quite distinct in gross appearance when closely examined, as well as in microscopic characters, they have never hitherto been distinguished and will doubtless be frequently met with in herbaria under *Roestelia* "*lacerata*," or the equally erroneous name *R. penicillata.* The general habit of the two is much the same, the *Roestelia nidus-avis* being, however, slightly less lacerate than *R. lacerata* and much darker owing to the rich rust brown color of its spores which contrasts strongly with the much paler dead brown of the spores of *R. lacerata* when seen *en masse.* Microscopically the two are separated at a glance, the spores of *R. nidus-avis* being smooth while those of *R. lacerata* are verruculose.

The *Gymnosporangium nidus-avis* it may be mentioned by no means confines itself to bird's nest distortions, but may occur in isolated areas on the smaller branches on which it produces a slight swelling like *G. clavipes*, or may attack the larger branches and even, not uncommonly, the main trunk of the tree in which its perennial mycelium has survived for years as a result of infection when the tree was very small, causing a conspicuous swelling of a part or the whole of the trunk, the bark of which in the diseased area is usually very rough. That these forms are not due to any species other than the *nidus-avis* has been shown by cultures.

The new species may be characterized as follows:

Gymnosporangium nidus-avis, nov. sp.

Sporiferous masses when young, cushion like, irregularly globose or oval, small and distinct or elongate and confluent according to the habitat; rich red brown; when mature indefinitely expanded by moisture, orange-colored. Teleutospores two-celled, irregular in shape, broadly ovate to sub-elliptical or fusiform, bluntly rounded or slightly tapering towards the apex, symmetrical or often slightly bent. Average dimensions .055 × .025^{mm}. Promycelia several, not uncommonly proceeding from either extremity. Pedicels when young often more or less inflated below the spore. Mycelium perennial in leaves, branches or trunks of *Juniperus Virginiana* very commonly inducing a " bird's nest " distortion.

Roestelia stage. Spermogonia yellowish orange, preceding the aecidia by about ten days. Aecidia hypophyllous or more commonly on petioles, young shoots and especially on young fruit, densely clustered, brown, at first subulate, then fimbriate; the peridia splitting to the base with its divisions slightly divergent. Peridial cells rather slender; the ridges somewhat prominent, sub-labyrinthiform, horizontal or becoming inwardly oblique towards the extremites. Average measurements (towards the apex of the peridia) .07 × .018^{mm}. Aecidiospores smooth, spherical or irregularly oval to oblong, average diameter 25^{mm}.

Mycelium annual in the leaves of *Cydonia* (quince) and in leaves, stems and fruit of *Amelanchier Canadensis* (Service berry) in June.

FUNGUS IN VIOLET ROOTS.

BY DR. ROLAND THAXTER.

Specimens of diseased violet plants have been received at the Station several times and the present note is designed to call attention to the presence in the roots of such diseased plants of a peculiar fungus, not previously observed in this country, as far as the writer is aware. It is a well known fact that in the Middle and New England states violet growers are often subjected to great loss from the effects of a somewhat obscure affection which stunts or hinders the growth of the violet plants, causing them to turn yellowish and giving them a generally sickly look. This sickly condition may be present in plants grown under glass as well as in open ground, and appears to attack those grown out of doors most severely during continued damp weather. It may or may not be accompanied by the leaf spot fungus (*Phyllosticta violæ*) which in itself is often a very destructive disease, or by certain minute insects resembling the "red spider" of greenhouses, but much smaller and hardly visible to the naked eye, which might be responsible for much of the damage. Nevertheless many plants having the characteristic sickly yellow look of the violet disease have been received and examined, on which no sign of either the fungus or the insect could be found. No apparent cause for the observed condition being discoverable in the portion of the plant above ground, the writer was led to examine the roots and stems with some care and after washing the earth from the former, great numbers of dark spots were observed commonly involving the whole substance of the root for a distance of a few millimeters. Sections of such spots show the tissue more or less blackened and destroyed and lying in the cells, in greater or less numbers, certain peculiar looking squarish brown bodies, sometimes filling the cells completely and looking not unlike some form of smut. These squarish bodies are the result of the breaking up of large cylindrical 2–5 (or more) septate brown spores formed from a rather scanty septate mycelium which apparently causes the death of the root cells at the affected points.

The fungus is undoubtedly the form described by Zopf (Sitz. d. Bot. Ver. d. Prov. Brandenb. June 1876, p. 105) under the name *Thielavia basicola*, figured in Winter's Pilze (Vol. II, p. 44) and also described and figured by Sorokin as *Helminthosporium fragile* (Clasterosporium frag. Sacc.) in Hedwigia (1876, p. 113) where the characteristic breaking up of the spores into squarish segments is well represented. According to Zopf the fungus is the same with the form described by Berkeley & Broome (Ann. and Mag. of Nat. History, Ser. II, Vol. V, No. 465, Pl. 11, fig. 4) as *Torula basicola*, yet for reasons not mentioned all these are kept distinct by Saccardo.

Zopf describes an ascosporic condition on which the genus Thielavia is founded, which has not been observed by the writer except as a parasite on other fungi (species of Isaria), and states that a very serious disease of the roots of Senecio is due to its action.

As concerns the disease of violets, however, it seems doubtful whether the observed injury done by the Thielavia would alone account for the condition of the plants, yet the mere presence of a form supposed to cause serious disease in the roots of other plants, seems of sufficient interest to warrant the present note.

Another disease of violet roots due to nematode worms and common in Connecticut as in other localities, produces great numbers of hard rounded swellings upon the roots, but according to the statements of several violet growers does not appear to do much injury to the plants.

PRELIMINARY REPORT ON THE SO-CALLED "POLE-BURN" OF TOBACCO.

By William C. Sturgis, Ph.D.

Ever since the year 1833 when the tobacco industry of Connecticut was permanently affected by the introduction from Virginia by B. P. Barber of East Windsor of what is now known as the "Barber broad-leaf variety," and the growing of fine, silky tobacco suitable for wrappers, superseded the strong, narrow "Shoestring" tobacco, this important crop has been seriously injured by several diseases, mycological as well as physiological in nature.

The present report has to do with the cause and effects of one of these diseases, familiarly known in this State and in other sections of the country as "pole-burn," "pole-sweat," and "house-burn," names indicative of the burned appearance of the affected leaves.

Origin of "Pole-burn."

Practical experience has shown us the conditions under which this disease makes its appearance. Thus all tobacco-growers know that if the tobacco is cut and hung during warm, damp, and foggy weather it is very susceptible to "pole-burn;" that if a period of such weather ensues a week or ten days after the hanging of the tobacco, even though the conditions under which the tobacco was cut and hung were favorable, the crop is sure to suffer more or less; in brief, that the severity of the disease is intimately connected with atmospheric conditions.

The appearance of tobacco affected with "pole-burn" is too familiar to require any extended description.

As the disease was first brought to the notice of the writer it was seen to be characterized by the appearance on the surface of the leaf, of small blackened areas, giving the leaf the aspect of having been sprinkled with sulphuric acid, or some other corrosive liquid. At first the disease is limited to the neighborhood of the veins and midrib of the leaf where moisture is superabundant, but its spread is very rapid, the small blackened areas increase in size, become confluent, and sometimes within thirty-six, or at most forty-eight hours, not only is the whole leaf affected, but the entire contents of the curing barn may be rendered quite worthless as tobacco. Examination shows that the leaves have changed from greenish-yellow to a dark brown or almost black color, that the fine texture has disappeared, and that instead of being tough and elastic, the whole leaf is wet, and soggy, and tears almost with a touch, falling of its own weight from the stalk.

The severity of the disease varies, as has been said, with the atmospheric conditions of warmth and moisture, and certain years, e. g. 1872 and 1878, are memorable in Connecticut, as having been peculiarly conducive to the disease. The 10th Census of the United States is authority for the fact that the weather throughout the curing season of those years was damp and foggy. It is, however, safe to say that a tobacco crop is very seldom, if ever, cured in Connecticut without showing some trace of disease. Even during the most favorable seasons the disease does make its appearance in the center of the curing barn where the temperature is higher and the moisture more retained in and about the leaves, whereas in unfavorable seasons the loss has often amounted practically to the entire crop.

Finally, the disease is not peculiar to Connecticut. The Station has been in correspondence with the principal tobacco-growers of Virginia and Kentucky with reference to the subject and the replies have been invariably that the disease is well known in both States, and that it is induced or aggravated in air-cured tobacco—that is, tobacco cured without the aid of artificial heat—by hanging the tobacco too closely crowded in the barn to admit of the free circulation of the air; by hanging it when moist or wet from dew or rain, and by fogs penetrating the barn; or by the prevalence of damp sultry weather.

The past curing season in this State was exceptionally favorable to the tobacco grower, so much so that it was found impossible to secure specimens of diseased leaves for examination at the Station until the latter part of October. It was then learned that the disease had made its appearance at Melrose, and had destroyed in thirty-six hours, 2000 lbs. of Connecticut seed leaf. A quantity of the diseased material was sent to the Station, and was there subjected to thorough microscopic examination. On the less damaged leaves the appearance was as described above, but a small hand-lens revealed in the center of each blackened spot, a minute, elevated pustule. Sections through the center of one of these pustules showed that the tissue of the leaf was largely disintegrated, and the cells themselves were completely filled with bacteria, which as they issued from the cells in vast numbers, gave a milky appearance to the water in which the section was lying. This being presumably the incipient stage of the disease it was only necessary in order to trace its development, to select a series of leaves showing more and more advanced stages of decay and to examine the pustules successively. This method showed that the bacteria develope rapidly in the tissue of the leaf, raising the epidermis, and finally breaking through at one or more points in the blackened area. Oozing through the ruptured tissue, they spread out in a thin slimy film over the surface in the immediate neighborhood of the pustule, finally forming a brown, translucent crust of a cheesy consistency, and composed entirely of the bacteria themselves. It was now an easy matter to take a minute portion of this crust, place it in a drop of distilled water through which it at once became disseminated, and examine it under the microscope, or transfer a portion of it to some nutrient material, liquid or solid. Examination with the microscope showed that there were invariably two forms of bacteria present, and only two—one in the shape of minute rods very rarely connected in chains, and belonging therefore to the genus Bacterium, the other consisting of spherical cells often united in chains and belonging to the genus Micrococcus.* It must be noted that two forms of bacteria very similar to those described—a Bacterium and a Micrococcus—always accompany, and are taken to be the active agents in, putrefaction whether of vegetable or animal substances, and the question naturally arises whether we have here merely a process of fermentation and putrefaction (whatever we may mean by these terms) common to all putrescible substances, and induced by the previous growth of some fungus on the diseased spot, or whether we have to do with specific agents of disease peculiar to tobacco.† A fungus related to one of the common leaf-diseases of the tomato, of the genus Cladosporium, does occur in spots on tobacco leaves. Leaves partially cured, that is, leaves taken at the period when the "pole-burn" usually makes its appearance, but free from any developed fungus and bacterial disease, were kept in a damp atmosphere for some days. Under these conditions there developed on the leaves in the course of a few days, small brown spots of a velvety appearance under the microscope, the Cladosporium mentioned above. This fungus caused no wide-spread damage to the leaf, being limited to the very small spots in which it first appeared. In the course of six weeks, however, examination showed that the fungus was decaying rapidly and that in its place vast numbers of bacteria were developing, identical with those found in the pole-burned leaves. The gross appearance of the decaying areas was similar to that characteristic of "pole-burn," though owing to the fact that the leaves were by this time almost thoroughly cured, the spread of the decay was not so rapid. Finally, mingled with the bacteria in the pustules of leaves undoubtedly afflicted with "pole-burn," there were often found the remains of a fungus identical with the Cladosporium above mentioned.

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*The dimensions of these two forms are: Bacterium, $1.9\mu - 3.7\mu \times 0.8\mu$; Micrococcus, spherical, $0.9\mu - 1.4\mu$ in diameter.

† In this connection it is well to note that a German investigator, Emil Suchsland, has recently discovered living organisms belonging to the groups Bacteriaceæ and Coccaceæ, associated with the process of fermentation of all kinds of tobacco. "Generally," he writes, "only two or three species are found on each kind of tobacco. Bacteriaceæ predominate, but Coccaceæ also occur. That these

We may therefore infer, although conclusive results can only follow further examination, that "pole-burn" is due primarily to the growth of a fungus upon the leaf, which by disintegrating and partially destroying the tissue of the leaf, gives access to a bacterial process of decay.

Were it not for this process of decay, however, we should have little to fear from the Cladosporium. The latter, as we have seen, is very limited in its area of growth, but the reproductive activity of the bacteria is very great, and the decay which they cause spreads with corresponding rapidity. For this reason the investigations undertaken in the laboratory have been upon

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bacteria are the active agents of the ferment of tobacco is shown by the fact that if pure cultures are made from one kind of tobacco and another kind is inoculated with this pure material, there is reproduced in the latter tobacco the flavor and aroma characteristic of the original tobacco." By making use of the proper forms of bacteria Suchsland succeeded in so improving the quality of German domestic tobacco that experienced judges were unable to recognize it. E. Suchsland, Ueber Tabaksfermentation. Ber. d. deutsch. bot. Ges. Band ix, Heft. 3 April, 1891, pp. 79–81.

It may be therefore that the damage to curing tobacco known as "pole-burn" is merely an abnormal development of the same bacteria which are the active agents in the subsequent process of fermenting or "sweating" of the tobacco.

the bacteria themselves and the means by which their activity may be prevented. It is a matter requiring only delicate manipulation, to isolate the bacteria from the "pole-burned" leaves, and to obtain pure cultures. These were made in test-tubes on both solid and liquid media. The bacteria developed readily on potato-agar with a slight percentage of tobacco-ash or a trace of peptone, on slices of sterilized potato, and in potato broth with a trace of peptone. The sterilized potato gave the best results, and the cultures have been continued on that substance. Under these conditions the bacteria form on the surface of the potato round, or elongated and irregular colonies, of a slimy consistency, varying in color from livid gray to deep orange, and producing in the potato a dark stain beneath and around the colonies. In liquid media they develope, not on the surface, but as a flocculent deposit in the liquid. Certain facts may now be noted and compared with facts ascertained in the curing of tobacco.

(1) As the cultures become dry, the bacteria cease to develope so rapidly, and finally their development ceases. They require therefore moisture for growth, and decreasing the amount of moisture decreases their vitality. This bears out the general view that the origin and spread of "pole-burn" is in some way connected with an excess of moisture in the curing-barn.

(2) Nine tubes containing each a slice of sterilized potato were inoculated with the bacteria. Of these, three were kept at a temperature of 100° F., three at a temperature of 70° F., and the remaining three at a temperature of about 40° F. At the end of three days the tubes kept at 70° showed the usual growth, the colonies averaging 1½ inches in length by ½ inch in breadth; neither of the other sets of tubes showed any marked growth, but upon being placed at the medium temperature for forty-eight hours the development of the bacteria proceeded with marked activity. These experiments were repeated at various degrees of temperature. Temperature therefore has a marked influence upon these germs; warmth, up to 70°, and even 90°, is favorable to their development, whereas temperatures above 100° or 110° and below 35°–40° act as a temporary or permanent check upon their vitality. To this fact again we find a corresponding theory, that warmth as well as moisture is conducive to "pole-burn." Inasmuch as in this regard bacteria, as a rule, follow the laws governing the active growth of the higher fungi, it is immaterial at present to decide whether the former or the latter are the primary

cause of "pole-burn," since the means which may be recommended to prevent the decay, apply equally well to arresting or preventing the growth of the Cladosporium.

(3) One more fact should be stated, viz: that all attempts to inoculate thoroughly cured tobacco with the bacteria, failed. This result is partial confirmation at least of the generally expressed view that when tobacco has cured to a certain degree, the period varying from ten days to three weeks after hanging, there is very little danger to be apprehended from "pole-burn."

Remedial Measures.

"Insufficient or badly managed ventilation is the chief cause of bad curing."*

We have seen that whatever is the primary cause of "pole-burn," its ill effects can be in a large measure, if not entirely, prevented by a proper regulation of moisture and temperature. Our first care therefore should be to provide a weather-proof building in which to cure the tobacco, so that if the external air should by reason of rain or fog become surcharged with moisture, the curing tobacco may be rendered independent of such a condition. This is comparatively a simple matter. At present the barns used for curing tobacco in Connecticut are, as a rule, anything but weather-proof; they are generally roughly built, and the air within them is, even when the doors are closed, practically in the same condition as the outside air, whether the latter be dry or moist. Under such conditions it is only to be wondered at that a crop is ever cured satisfactorily. The first step then, should be to render the existing barns as far as possible weather-proof, by covering them with water-proof paper and sheathing, or by any other means which commends itself to the common-sense of the grower. Having secured this condition, the next step should be to secure free ventilation. Not only does an excess of moisture in curing tobacco come from the external atmosphere if the barn is not weather-proof, but the tobacco itself in the process of curing gives off a large amount of moisture, and if fermentation takes place, a considerable degree of warmth is generated; so that even if the barn should be weather-proof, there exist within it all the conditions favorable to the development of "pole-burn."

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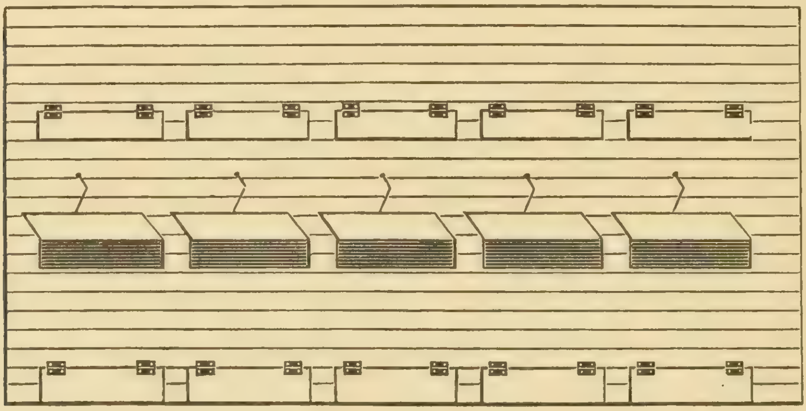
* Tenth Census of the United States, 1880, vol. iii, Report of J. B. Killebrew, p. 107.

VENTILATION.

This excess of warmth and moisture can be remedied only by a complete system of ventilation. Fortunately such a system can be readily and cheaply adapted to the existing tobacco-barns. It should be such that when the weather is sufficiently dry to expedite the curing of the tobacco, air can be admitted freely and can circulate *from below upwards*, in order that the warmth and moisture generated by the tobacco shall be carried up, and out through ventilators in the roof, being displaced by the dry air coming in from outside. The best method to secure free and uniform ventilation is to have a row of *horizontal* ventilators near the ground, a similar row for each tier of tobacco, and one or more large ventilators along the ridge-pole. The ventilators in the walls should open *horizontally* at intervals of about four feet as shown in the cut. They should be from five to ten feet long, one foot high, hung from the upper edge by strap hinges so as to be raised and hooked up, and occupying the full length of the building. When these are all open, the air will enter freely, not only near the ground, but also just below each tier of tobacco. Free ventilation in the roof to allow of the escape of moist, warm air, is absolutely essential. This can be secured by large cupola ventilators placed at intervals of twenty or thirty feet along the ridge-pole and reinforced by openings under the eaves, or better still the ridge-pole may be occupied by a continuous slat ventilator running the full length of the barn and reinforced if necessary by a similar ventilator midway down the slope of the roof on both sides.



We have thus secured, at a very slight expense, a free circulation of air through the barn and an outlet for the accumulating moisture from the leaves, when the weather is dry; and at the same time, in case of a period of prolonged damp weather, the barn can be rendered weather-proof and the curing can proceed in a measure independently of atmospheric conditions.

It must, however, be remembered that we are not aiming merely at rapid *drying* of the tobacco. The terms "drying," and "curing," are by no means synonymous. The change of color in curing tobacco is largely due to a process of fermentation which takes place in the hanging tobacco, and for which a certain amount of moisture in the leaf is a prerequisite. If the leaf is dried too rapidly this fermentation is either prevented or checked, and the result is a disagreeable, sickly green color in the product, instead of the rich brown desired. With a weather-proof barn, well provided with ventilators, the curing of the tobacco may be made to proceed as rapidly or as slowly as the circumstances, and the desired quality of the product, demand, in other words the process of curing, and therefore the result, under these conditions, depends only on the good judgment of the one in charge of the operation. If the tobacco is not curing rapidly enough owing to damp weather, the barn can be tightly closed; if, on the other hand, the process is proceeding too rapidly, the barn may be closed by day and opened by night; or if more moisture still is required, it may be closed and the floor sprinkled with water. If again, the weather is hot and dry, so much so that the rays of the sun will bleach the leaves, the barn can be closed so as practically to exclude both light and air.

With regard to the floor of the barn, the older barns of this State have dirt floors, and inasmuch as the "dampness arising from the ground is supposed to exercise a beneficial influence on the curing process,"* there seems to be no present necessity for a change in this respect, which would involve considerable expense.

CHANGES INDUCED IN THE PROCESS OF CURING.

We have thus far seen the advantages to be secured in the curing of tobacco by conducting the process in a weather-proof barn where ventilation and hence the influence of atmospheric conditions is to a great degree under control. But even under these conditions a successful cure will depend largely upon good management. Tobacco which is very rapidly dried out by means of a constant current of dry air, especially at a high temperature, undergoes very little, if any, chemical change, and retains to a greater or less degree its green color. Moreover, since the process of fermentation in bulk, accompanied by heat, depends upon and must be preceded by the changes in the leaf produced by gradual curing, it follows that tobacco which has been too rapidly dried loses to a great extent its ability to pass through the process of subsequent heating and sweating in bulk, and the greenish color remains permanent.

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* Tenth Census of the United States, 1880. Report of J. B. Killebrew, p. 248.

If the tobacco is dried in a current of air, care being taken not to drive the moisture out too rapidly, a change takes place in the interior of the leaf characterized by a change of color from green to brown, and the formation of *nitric acid* as a product of partial fermentation.

Finally, if tobacco is hung so closely as to prevent the free access of air, the color changes to brown, but *ammonia* is formed as a product of fermentation, the leaf loses its tenacity, becomes subject to "pole-burn," and decay follows to a greater or less extent.

These facts have been stated at length by two German investigators,* and are borne out by experience in this country.

It follows therefore that to secure immunity from "pole-burn" we must not only have the ventilation of the barn itself under our control, but the utmost importance must be attached to the method of hanging the tobacco so as to secure free circulation of air about each leaf.

METHODS OF CURING.

This brings us to a consideration of the two methods now in vogue of hanging tobacco, the older method of cutting and hanging the whole stalk with the leaves attached, and the method of detaching the leaves from the stalk before hanging, a method which is comparatively new in this country, but is almost universally employed in Germany and France. It is not our intention at present to discuss the merits of either method, inasmuch as the data at hand are not such as to warrant such a discussion. It will be well, however, to state briefly the arguments which are generally adduced for and against each method, and thus enable each grower to act as seems to him best, reserving any expression of opinion until further observation warrants such expression.

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* Nessler, Der Tabak, seine Bestandtheile und seine Behandlung, pp. 109, 110. L. von Wagner, Tabakkultur, Tabak- und Zigarrenfabrikation, pp. 34–38.

In the Tenth Census of the United States, (p. 44 of J. B. Killebrew's Report) various reasons are given showing the advantage of curing the leaves separately, over the method of stalk-curing. The advantage first stated is that all the leaves may be harvested when just ripe, and that therefore the crop shows a greater weight per acre. This is an undoubted advantage if absolutely true. That depends, however, on whether tobacco leaves attached to the stalk, do or do not mature after the stalk is cut, that is, whether the leaf feeds from the stalk during the process of curing, or the stalk from the leaf, or whether there is no appreciable transfer of material one way or the other. Upon this point opinions differ. One undoubted authority on the subject says: "Cut twigs or herbs yield to their leaves, etc., the water and the dissolved nutriment which the stems contain. The course is always from stem to leaf so far as the expenditure is concerned. Hence leaves and fruit grow heavier under such circumstances, as is well shown in the ripening of grains on cut wheat. But the same nutriment which is called for by the leaf, etc., is also likely to be used by new buds, and hence (when this happens) the leaves suffer. Practically when tobacco is cut and new buds (suckers) do not start or are arrested before they get very far, the leaves gain in dry weight, and that is a distinct advantage."

This view is also borne out by Wagner* who says: "If the leaf is picked before it is ripe, it needs a process of subsequent ripening to give it a good quality. This is impossible if the leaf is separated from the stalk, but it takes place to perfection under the American method" (the leaves cured while still attached to the stalk). With this view another German writer, W. Tscherbatscheff,† also agrees. On the other hand an experiment conducted by Nessler‡ shows that the dried constituents of tobacco leaves cured on the stalk, and separate from it, show no appreciable difference in weight;* and finally, going to the other extreme, a recent experiment conducted at the North Carolina Experiment Station with a view to settling the matter, indicates that a comparison between the weight of one half of a crop of tobacco cured on the stalk, and the other half cured separate from the stalk, shows a difference of weight of 128 lbs. per half acre in favor of the latter. These opinions are irreconcilable at present; but there is certainly a possibility that the leaves may mature and increase in weight while attached to the cut stalk, and that the curing of the two together may therefore yield as large a weight as when the leaves alone are cured.

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* Wagner, l. c. p. 38.

† Tscherbatscheff, W. Der Tabak und seine Kultur in den nordamerikanischen Staaten, Landwirthschaftliche Jahrbücher, 1875, p. 102.

"The weight of tobacco leaves cured on the stalk is 15 per cent. greater than that of leaves cured separate from the stalk."

‡ Nessler, l. c. p. 111.

There is, however, another point in this connection. We are aiming to secure free circulation of air about each leaf, so that, other things being equal, it is merely a question which method will best accomplish this. It has been argued very rightly that by stripping the leaves they can be hung much more loosely, that is, farther apart, and that the crop can be cured more quickly.

But as has been seen, the latter is not always an advantage, and if circulation of air sufficient for gradual and continuous curing is obtained when the entire stalk is hung with the leaves attached, our object is fully attained and a looser method of hanging is not absolutely necessary. Whether that object is attained by this method is, however, very doubtful, experience seeming to show that those leaves which are more or less covered by the overhanging leaves of the stalk are most subject to the attacks of pole-burn.†

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* The following figures representing the results of this experiment are copied from Nessler's work.

Calculated from dry material, 100 parts of tobacco contain:

Dried.	Ash.	Total Potash.	Soda.	Carbonate of Potash.	Nitrogen.	Fat.
No. 1. On the stalk	22.02	4.62	0.67	3.62	2.34	
Leaves alone	23.24	4.65	0.59	3.46	2.00	
No. 2. On the stalk	24.57	3.24	0.36	0.27	4.66	5.20
Leaves alone	23.22	3.26	0.46	0.35	4.22	5.00
No. 3. On the stalk	22.12	3.79	0.19	2.43	3.25	4.93
Leaves alone	22.86	3.84	0.24	2.88	3.96	4.56

† Upon this point Nessler (l. c. p. 110) writes: "In many localities the stalk is cut with the leaves and both cured together. It cannot be denied that with due care this method presents many advantages. The leaves never hang so close together as to prevent the circulation of air, consequently more nitric acid and less ammonia is formed, and the leaves are less liable to rot. By this method the tobacco cures better, especially as regards the burning quality."

The questions of the final weight of the product and the free circulation of the air are not the only ones to be considered in this connection. It is urged in favor of picking the leaves that the different qualities may thus be kept separate from the start, and that therefore less time is required for preparing the product for market; that the saving of barn room is considerable, six tiers containing leaves only, being accommodated in a space large enough for only four tiers containing both stems and leaves; that the physical strength required to strip and hang the leaves alone, is much less than when the stalks are cut and hung, and can therefore be done by girls and boys at slight proportional expense; and finally that the second crop of suckers and leaves arising from the stalks left standing, if ploughed in, forms a most valuable fertilizer, superior to the dried stalks.* It might be further urged that it is difficult to dissipate the excess of moisture given off by the large, juicy stalks in the curing process, that the process is thereby unnecessarily delayed, and the leaf decidedly endangered. This objection to stalk curing is certainly a most striking one in any section where tobacco is cured by air only, without artificial heat, and merits the serious consideration of the Connecticut growers.

To sum up on the other side, the added expense of the method of picking and hanging the leaves alone, including as it must the initial expense of special devices for hanging the leaves,† must be an objection in the mind of every grower of tobacco, unless he is convinced that the superior quality of the product, and the consequent increase in its value; the saving of time; and therefore of money, in the process of curing; and the increased immunity from "pole-burn" attendant upon a less crowded method of hanging the tobacco, outweigh the increased expense of harvesting. Enough has been said upon these points to enable a grower to decide the matter for himself as conclusively as it is possible at present for anyone to decide it. Opinions differ regarding this added expense. One grower in Virginia writes: "The cost of leaf curing is from actual experience much greater than in curing the entire plant and I have failed to find any compensating advantages to be derived from it." Another grower in Kentucky says: "I do not believe that the advantages received from stripping the uncured leaves, if there are any at all, compensate for the additional labor." On the other hand, Maj. Ragland, perhaps the largest grower of tobacco in Virginia, writes that he has for years employed both methods with success, and there is no doubt that in parts of Virginia and North Carolina the method of stripping the leaves has recently come into decided favor.

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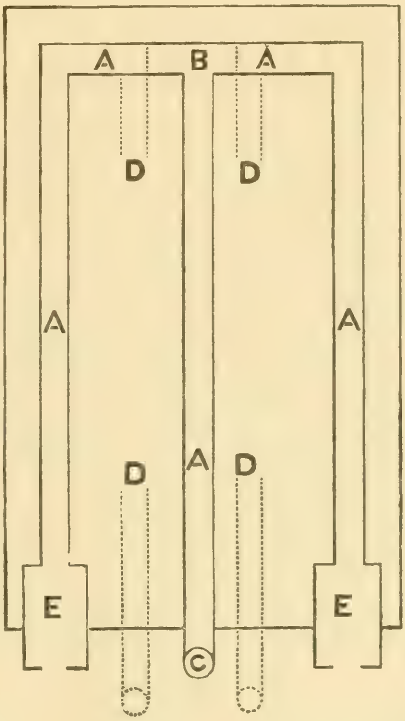
*It sometimes happens that the earlier hatched "tobacco worms" or "horn-caterpillars" complete their transformation on the first crop of tobacco. The moth then lays eggs upon the second growth in the fall, and it is in order to destroy this second brood that the ploughing in of the second growth is often recommended.

†The wired sticks used in what is known as Snow's Modern Barn System are quoted at $5.00 per 100 cash, or $6.00 per 100 on time. Similar curing sticks provided with wires are manufactured by the Tobacco Hanger Manufacturing Co., of Houston, Va., and are quoted at $3.00 per 100 cash or $3.50 per 100 on time.

The Employment of Artificial Heat.

We must, however, pass to another measure which, when properly employed has, as far as we can learn, never failed to prevent "pole-burn," viz: the use of artificial heat, when necessary, during the process of curing. It has been more than once suggested that any machinery that could be devised to ensure active circulation of air through the barn, would, even in damp weather, prevent the occurrence of "pole-burn." It seems difficult to believe, however, that a disease, the harmfulness of which is largely due to warmth and moisture, would be materially checked by a free supply of warm, damp air, even though that air were in motion. It would seem more reasonable to dry the air in the barn by means of the application of artificial heat conducted by flues. In many sections of the country, especially in the South, where the tobacco industry has been long established, this method of curing has largely superseded air-curing. It is quite possible that in our climate we may secure immunity from "pole-burn" by merely altering our barns as already suggested, so as to ensure the interior from unfavorable atmospheric conditions, and at the same time provide for free ventilation; but when we have taken this step, it may prove merely preparatory to the final step of providing the existing barns with artificial heat. At any rate, inasmuch as this would undoubtedly prove a remedy against "pole-burn," a few words on the subject cannot be superfluous. In a letter addressed to the Station under date of Dec. 10th, Maj. Ragland says: "I have never known tobacco cured by artificial heat to be damaged by "pole-sweat" or "house-burn," so called," and this is the testimony of practically all the growers in the South and West with whom we have corresponded. This being the case, it remains to see how artificial heat conducted through flues can be adapted to the barns at present existing in Connecticut, for it goes without saying that it would be impracticable to build new barns for the sake of providing them with a simple system of flues, and that open fires in the barn would produce a markedly unfavorable effect upon "wrapper" tobacco. This is a matter involving by no means so great an expense as has been often imagined; the flues and simple furnaces are comparatively cheap, much of the work can be done by unskilled labor, and it is not even necessary to substitute board floors, for the earth floors which many prefer. The simplest method seems to be that figured and described on p. 192 of the Report on Tobacco already referred to in the Tenth Census of the United States, and figured in the accompanying cut. Trenches are dug in the floor of the barn 15 to 18 inches wide and of the same depth, the side trenches being 12 or 13 inches from the walls of the barn, AAA. These side trenches encircle the floor space on three sides of the barn, meeting at the center in the rear, B. Here they connect with a trench BC, running lengthwise through the center of the barn. If it is desired to keep this portion of the floor free for the admission of wagons, the plan suggested in the Census Report may be adopted, each side trench being continued down the center independently, as indicated at DD, leaving a free space running the full length of the barn in the immediate center. These trenches covered with sheet iron or fire-proof stone, preferably lined with brick, may themselves serve as flues; or sheet-iron flues 12 to 15 inches in diameter, such as are used for stove piping may be laid in them. In any case the side flues should rise gradually from front to rear, and the central flue or flues from rear to front, about 1 inch in 2 feet, so that the point where the latter issue from the front wall of the barn will be elevated considerably



above the point where the side flues issue from the furnaces. The side flues each connect with a furnace E E at the front of the barn. The furnaces must be sunk below the level of the ground sufficiently to permit of the flues entering the upper part; they may be built of fire-proof brick or of iron, or some simple form of ready-made furnace may be found to be ultimately cheaper. The plan described in the Census Report provides that the flues shall be *built up* 18 to 20 inches *above* the level of the floor instead of being sunk a like distance *below* that level. Such a flue would give off more heat, since the heat would be given off from the sides as well as from the top, and also would allow of the furnaces being but very little, if at all, below the level of the ground; but it would occupy a good deal of floor space, which would be saved if the flue were sunk below the level of the floor. It might be possible in the latter case to cover the trenches containing the sheet-iron flues with heavy planking. This could be removed when the fires were lighted, but when in place would render the whole floor space available. The size of the furnaces must depend largely on the size of the barn and the diameter of the flues. The Census Report recommends for a barn 20 feet square, a furnace 5 feet long, 18 to 20 inches square in cross section, and projecting outside the wall 18 inches. The larger barns in use in Connecticut would have to be provided with larger furnaces, the size of course depending upon the size of the barn and the size of the flues. This could be readily estimated by any experienced furnace builder or dealer, but would probably in no case exceed a length of 10 to 12 feet, and a width of 6 to 8 feet. Of course it is difficult to estimate the expense incident to providing artificial heat by the method suggested. The cost for heating a barn capable of holding 5 acres of tobacco would probably be below $100. The Census Report, p. 68, states that "a barn of ordinary size* can be fitted with brick-walled and iron-capped flues, including cost of arches for the furnaces, and chimneys for carrying off the smoke, at a cost of from $40 to $75, varying with cost of materials and labor.

USE OF ARTIFICIAL HEAT.

There seems to be in the minds of many, an idea that the use of artificial heat is entirely to *dry* the tobacco, the quicker the better; and that the fires must therefore be kept up continuously at a considerable expenditure of fuel and labor. This is a mistake. It has been already shown that the process of curing is to a great extent a process of fermentation. To aid this process when other conditions are unfavorable, and to establish within the barn at critical periods conditions which shall prevent the occurrence of "pole-burn," are the only uses of artificial heat in this connection.

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*With a capacity probably of 1 to 2 acres. If iron furnaces were used the expense would probably be larger.

We cannot do better than quote at length from a letter on this subject recently received from Maj. R. L. Ragland, of Virginia, whose wide experience in the growing and curing of tobacco, gives weight to his opinion. He says: "I have never known tobacco cured by artificial heat to be damaged by 'pole-sweat' or 'house-burn' so-called. The heat evidently dispels or prevents any attack of bacterial disease and deterioration of the leaf during the curing process, except from scald or undesirable change of color due to excessive heat. Cigar tobacco requires very little artificial heat to cure properly—the heat should be used supplementally, and the temperature kept at a point that will keep the leaf drying *gradually*, but drying *all the time* until the moisture is entirely dispelled from the leaves. I have long advocated that all classes and types of tobacco are best and safest cured by the application of artificial heat to assist in drying, and this opinion is not based merely upon theory, but is found after trial in the curing of every class and type grown in this country. I have cured all of them with and without artificial heat, and give it as my opinion based on experience that tobacco cured over flues or stoves emitting no smoke is better than sun or air-dried tobacco. Tobacco of any class is more *speedily* and *thoroughly* cured by artificial heat than when air-dried, and it is a well known fact that tobacco thoroughly cured over flues will keep sounder than when air-dried."

We have heard the opinion expressed that tobacco cured over flues will not pass through a subsequent "sweating" or fermenting process. Others of experience have doubted that statement, and the doubt proves to be a reasonable one when the matter is tested. In the same letter from which we have just quoted, Maj. Ragland says, "Air-cured tobacco is not only the better for being "sweated" for months, but *requires* more time to complete this process than flue-cured tobacco. It is my experience that tobacco when bulked down 'in case,' viz: when it has absorbed enough moisture to render it supple and flexible, will always pass though a "sweat" if it remains in bulk long enough. And this is the case with tobacco cured by artificial heat as well as when cured without that aid. I believe that flue-cured tobacco bulked down will *in a shorter time* be ready for the manufacturer than sun or air-dried tobacco, but all tobacco so cured passes through a slightly fermenting process accompanied by the generation of heat."

This is all that can be said at present with any certainty on the subject of the causes, mycological and atmospheric, of "pole-burn" of tobacco, and the means which have been successfully employed in combating it. This report is, however, only preliminary; the subject is still under investigation, and it is hoped that further experience will tend to clear up certain points which are still doubtful, and warrant the publication of a special Bulletin on the subject.

STEM-ROT.

There is at least one more disease of tobacco affecting the crop in the latter stage of curing which merits some consideration. The stalk of the tobacco plant is, as we should expect in so rapid a grower, exceedingly succulent and juicy. For this reason, the proper drying of it as necessitated when the whole plant is cured, is a long and tedious process, often accompanied with most undesirable results. This stalk after it has been cut for some days, and has become partially wilted, forms a most admirable field for the growth of fungi, especially for those which usually grow upon dying vegetation. One such fungus at least, has proved most troublesome in the curing barns, and from its pernicious action is commonly known as "stem-rot." If stems affected with this disease are examined, they will be found to be covered with pure white patches having the appearance of a long-pile velvet. These patches spread rapidly, encroaching upon the veins of the leaf, and destroying the tissue, and in the end induce a more or less wide-spread decay, especially in the neighborhood of the mid-rib and veins of the leaf, where the moisture is longer retained than in the delicate tissue of the leaf. The velvety appearance is due to the growth of the vegetative part, or "mycelium," of a fungus long known to botanists, and belonging to a group of fungi familiar to the vegetable pathologist. We may place it for the present in the genus Botrytis.

The vegetative threads of the fungus grow at first over the surface of the stalk, and penetrate it to a greater or less extent. In the course of time erect branches arise from these threads in great numbers, often attaining a height of a quarter of an inch, and producing the white velvety or furred appearance on the stalk. From these erect branches there soon arise shorter branches at right angles to the main branches, and finally at the tips of these shorter branches the fruit is borne in the shape of vast numbers of spores.

The fungus seldom reaches maturity on the curing stalks, for it requires some days and considerable moisture for its complete development, hence by the time the vegetative threads are ready to produce the fruiting branches, the stalks are too far dried to afford the requisite nutriment. After the curing process is completed, however, the tobacco is taken down, and the stalks and leaves most seriously affected with "stem-rot" are thrown down on the floor with the refuse which always remains after the curing of a crop of tobacco. Here on the damp earth floors and in company with decaying stalks and leaves, the "stem-rot" fungus finds all the conditions favorable to its farther development. The fungus spreads among the refuse, and produces its spores in enormous quantities. It is not unusual upon entering a barn even during the process of curing, to find the floor partially covered with the refuse of the previous year's crop, the latter often looking as though a fall of snow had whitened it, so densely is it covered with the mycelium and spores of this fungus, named on account of its long fruiting branches or arms, *Botrytis longibrachiata.*[*] The slightest current of air serves to separate the spores from their attachment, and carry them through the barn, some finding lodgment upon and at once infecting the curing stems and leaves, others being deposited on the beams or walls of the barn and there remaining to propagate the disease another year.

Remedial Measures.

Against such a pest absolute cleanliness is the best and simplest precaution. After the crop is cured, all the diseased stems and leaves should be carefully collected and at once burned before the fungus has reached maturity. All the refuse remaining on the floor of the barn should then be thoroughly gathered together and burned, and the floor should be liberally sprinkled with a mixture consisting of equal parts of dry air-slacked lime and sulphur. If the floor is of earth, covering it to the depth of an inch with clean dry earth would prevent the dissemination of the spores through the air. A more effectual method of reaching the spores in all parts of the barn would be fumigation by means of sulphur, kept boiling for two or three hours in any iron vessel over a small kerosene stove. In the larger barns it would be advisable to have three or four such stoves, and keep the sulphur boiling simultaneously in different parts of the barn; of course during the process of fumigation the building must be kept tightly closed so that the fumes may thoroughly penetrate every part. If this were done once after the removal of the cured tobacco, and again the following season a fortnight before the tobacco is harvested, the danger from "stem-rot" would be largely decreased if not entirely obviated.

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[*] This fungus is not peculiar to tobacco but occurs on various dying or dead herbaceous plants.

In closing this report upon tobacco we wish to express our sincere thanks to Maj. R. L. Ragland, and Messrs. E. R. Cocke and W. T. Sutherlin of Virginia; to Messrs. Leslie Combs, A. P. Gooding, W. Z. Thomson, and Lewis L. Johnstone of Kentucky; and to Messrs. Austin and Pinney of Suffield, Conn.; all of whom have furnished most valuable information in connection with the subject.

NOTES ON THE CURING OF HAVANA SEED LEAF TOBACCO BY ARTIFICIAL HEAT.

The system of curing tobacco on the stalk in barns which are not weather-proof, or being weather-proof cannot be properly ventilated in very unfavorable weather, nor heated at any time, is almost universal in this State. The faults of the system are also universally recognized. In a very favorable season the curing is all that could be desired. In a clear dry season, like that of 1891, the cured tobacco is apt to show considerable "white vein;" *i. e.* the veins cure white and shining and make the affected leaves worthless for wrappers, a fault ascribed by growers to too rapid drying of the veins.

On the other hand, if warm, moist, ("muggy,") weather prevails for ten days after cutting the crop, it is sure to be associated with prevalence of "pole-burn" which may ruin from a tenth to a half of the entire crop, or in extreme cases actually the whole of it. "Stem rot" is another disease believed to be peculiar to pole-cured tobacco. These diseases of tobacco are discussed in the report of the mycologist, Dr. Sturgis.

Leading tobacco growers admit that the present system of pole-curing is very crude and unsatisfactory, chiefly for the reason that the owner cannot control the heat and moisture in his barns enough to prevent "pole-burn." It is admitted that artificial heat alone or with a supply of moisture at the same time might prevent this disease without damaging the color or texture of the leaves. It is also true that in past years no method to do this has been devised successful enough in Connecticut to warrant general adoption.

The Snow Modern Barn System.

A new process of harvesting and curing tobacco, the so-called "Snow Modern Barn System," was introduced into this State last season as an experiment, and the Station was asked by tobacco growers in Suffield to make observations on this mode of curing; particularly to test the conditions of heat and moisture in the barn while the curing was going on.

It is not necessary here to fully describe the barn and apparatus. Suffice it to say that the Snow Modern Barn System as a system of *curing* tobacco (certain important advantages are claimed in harvesting) consists in this. The fresh leaves, stripped from the stalks in the field are brought to the barn in baskets and strung through the butt back to back, about the width of a finger apart, on pointed wires which project at right angles from a wooden "stick."

As the "sticks" are filled they are placed in moveable racks in a barn and as fast as a rack is filled it is raised by a simple device to the top of the building. Other racks follow leaving only as much space between racks as is required for the hanging leaves.

The barn by a very complete system of ventilators can be closed tight or thoroughly ventilated. The floor is of slats and in the cellar are two small furnaces or stoves and a system of flues which exposes a large radiating surface and makes it possible to warm all portions of the floor space above evenly.

When the barn is filled and the leaves wilted, the heat is raised considerably above that of the air outside and held there. The moisture, however, is not allowed to escape freely from the building but the air of the barn is nearly saturated with it. Soon a "sweat" begins in the tobacco which produces more water and following shortly after, the leaf begins to change color, but without drying. The curer watches the color, regulating heat and moisture as experience has taught is necessary and when the color wanted is obtained he raises the heat and diminishes the moisture to "fix" the color. Finally the leaves become dry and the cure is done. It is only necessary then to moisten the leaves, which is quickly done by sprinkling water on the basement floor and leaving the building closed for sometime. The tobacco is then removed from the wires and bulked down to sell. The above is a brief outline only of the "System." The Modern Tobacco Barn Co. claim patents to cover "all tobacco sticks with projecting prongs on each side, at right angles to the stick, by any and all permanent means of attachment, no matter how attached or fastened."

The following advantages of this method are claimed by the representative of the company:

1. All loss from "burn," "stem rot" or "white vein" is avoided.

2. A more uniform color is secured than by pole curing.

3. Better control of the color is possible, *i. e.* it can be made dark, medium or light as the market demands.

4. Great saving of time is effected in curing the crop.

5. The tobacco so cured will not "sweat" as pole-cured tobacco sweats in the case, but only requires a short "mull" in bulk, to fit it for immediate manufacture.

THE EXPERIMENTS AT SUFFIELD.

In the spring of 1891 the Modern Tobacco Barn Co., through their agent, Mr. J. B. Roney, constructed a barn on Mr. H. H. Austin's farm in Suffield, at their own expense, and in the late summer and fall made several experimental curings of Havana seed tobacco grown in that town. Mr. E. F. Paschal who conducted the curings has had a wide experience with southern smoking tobacco, but as far as known the system had not been applied before to the curing of wrapper tobacco which is the only kind raised here. Mr. Paschal said at the outset that because of this difference in the character of the tobacco it was not to be expected that the first few trials would be perfectly successful. Experience would be needed to secure perfection of color in the curing.

The experimental barn was quite small—twenty feet long, sixteen feet wide and twenty feet high, with four sets of stanchions. About thirty thousand leaves can be conveniently cured in this barn at a time. The barn and fixtures were made on the same plan as those which are used in the South. The furnaces are made to burn wood. Should the method be introduced here probably coal or steam would be found cheaper and more convenient requiring less attention from the curer. In this experiment about a cord of hard wood was used in each curing.

Owing to the close attention required to the details of the curing process the representative of the Station was unable to gather data regarding the cost of picking the leaves and filling the barn, and indeed the only point which the Station was asked to investigate was the conditions of heat and moisture in the barn during the curing process. It was understood that the quality and quantity of the Modern Barn-cured tobacco as compared with the pole-cured would be determined by the growers themselves.

Mr. Winton of this Station witnessed the second and third curings and with an assistant made observations of the tempera-

Observations of Temperature and Relative Humidity in the Snow Modern Barn During the Curing Process.

Date.	Weather.	Temperature.					Relative Humidity.			
		Outside.	In the Curing Barn.				Outside.	In Curing Barn.		
			First Floor.		Second Floor.	Third Floor.		First Floor.	Second Floor.	
			Front.	Rear.						
August.										
22, 5 p. m.		85	85	92	89	92	56	85	--	
9 "		72	89	93	94	94	82	100	--	
23, 2 a. m.		64	87	91	92	93	93	100	--	
6 "		62	87	91	92	93	98	100	--	
10 "		77	93	96	97	100	75	96	--	Leaves wilting perceptibly.
2 p. m.		85	96	101	100	102	61	86	--	
6 "		79	96	103	100	103	70	86	80	
10 "	Heavy shower about 11 o'clock.	74	98	105	105	110	91	87	78	A few pails of water sprinkled in basement [at 7.30.
24, 2 a. m.		70	96	98	100	103	100	90	80	Leaves beginning to turn yellow.
6 "	Damp and rainy following clear sunrise.	69	93	97	98	102	98	89	81	One fire out for short time.
10 "	Mist and rain.	76	96	100	100	105	94	88	77	
2 p. m.	Sunshine at 12 m.	83	97	104	101	106	77	85	77	
6 "		80	96	108	102	106	78	78	69	
10 "		76	95	101	100	106	93	81	77	Leaves fully wilted and decidedly yellow on tips and in spots.
25, 2 a. m.		74	93	98	98	106	91	82	76	
6 "	Clear day.	74	95	100	101	107	91	81	71	Leaves brown on tips and in spots.
10 "		81	96	100	101	105	71	79	71	Six pailfulls of water added at 9.30 a. m.
2 p. m.		83	96	101	100	105	53	78	67	
6 "		77	96	101	100	106	63	76	65	
10 "		69	93	98	99	102	72	78	66	
26, 2 a. m.		66	90	96	96	100	80	77	67	
6 "	Cloudy.	65	91	98	98	105	80	74	64	
10 "	Few drops of rain at noon.	71	97	102	103	107	71	73	64	Strong tobacco odor in barn for first time.
2 p. m.		73	98	102	103	108	78	73	67	
6 "	Light rain till 6 a. m. of 27th.	72	97	102	103	106	88	75	67	
10 "		70	95	104	105	111	93	74	65	
27, 2 a. m.		69	93	98	100	105	97	75	65	The leaves were about one-quarter brown.
6 "	Dense mist.	67	96	101	102	108	100	80	63	
10 "		70	101	107	107	113	91	70	60	Tobacco odor in barn almost unendurable.

OBSERVATIONS OF TEMPERATURE AND RELATIVE HUMIDITY IN THE SNOW MODERN BARN DURING THE CURING PROCESS.

Continued.

DATE.	WEATHER.	TEMPERATURE.					RELATIVE HUMIDITY.			
		Out-side.	In the Curing Barn.				Out-side.	In Curing Barn.		
			First Floor.		Second Floor.	Third Floor.		First Floor.	Second Floor.	
			Front.	Rear.						
August.										
27, 2 p. m.	Shower at 3.00 p. m. Then "open and shut" weather.	77	102	106	107	112	84	69	60	
6 "		77	101	106	106	111	89	71	64	
10 "		73	100	106	106	111	95	67	59	
28, 2 a. m.		73	98	104	104	110	95	65	59	
6 "		72	102	109	109	115	97	62	54	Browning of leaves continues.
10 "	Shower.	78	103	109	109	119	84	63	55	Opened two top ventilators.
2 p. m.	Rain.	73	102	107	107	109	93	62	55	Most of the leaves are brown except on the ribs The midribs are still juicy or "fat."
6 "	High wind began at 8 p. m.	74	106	112	111	119	86	58	54	
10 "		66	106	112	112	115	66	50	40	Leaves near the door still greenish.
29, 2 a. m.		60	97	100	103	107	65	43	37	Till now the midribs have not cured much.
6 "		56	97	97	98	105	65	37	31	Ventilators shut. Midribs drying.
10 "		60	115	122	123	137	63	42	35	Tobacco odor still very strong
2 p. m.		71	114	118	118	128	52	39	38	
6 "		65	116	124	122	136	61	39	34	
10 "		60	132	140	140	162	73	--	31	
30, 2 a. m.		58	124	129	133	147	89	31	28	
6 "	Rain toward morning.	58	127	133	135	147	94	24	23	
10 "		58	128	135	136	148	94	23	20	Midribs almost dry except by door.
2 p. m.		60	142	151	151	169	95	22	20	
6 "		60	149	156	156	171	84	16	12	
9 "		59	150	156	158	169	94	12	10	Fire left to go out.
31, 8 a. m.	Cloudy day.	60	84	86	86	88	68	34	35	Opened top and bottom ventilators and added about 50 gallons of water.
12 m.		66	70	75	74	79	61	73	58	
5 p. m.		67	74	77	78	80	81	88	63	At 3 p. m. leaves getting pliable. Much water [added.
7 "	Few drops of rain.	63	70	73	74	75	89	82	82	Opened all doors and side vents.
9 "		62	66	73	74	75	89	82	82	
September.										
1, 8 a. m.		61	61	--	--	--	89	--	--	Leaves fairly moist though midribs still rather brittle.

ture at five different places and of the relative humidity of the air at one place in the building every two hours day and night from 3 P. M. on Aug. 22 to 8 P. M. on Sept. 1.

The accompanying table pages 190 to 191 gives in detail the observations made by Mr. Winton. The term "relative humidity" signifies what portion (per cent.) of the moisture which air of the given temperature could possibly hold, was actually present at the time of observation.

The particulars regarding the weather, the temperature and humidity of the interior of the barn as well as of the outer air and of the progress of the curing are given in the table.

A study of the figures and of Mr. Winton's notes will make evident the following facts.

Some of the leaves near the door did not come to color properly and the thermometer hung near the door shows greater fluctuations than the others because very many people visited the barn during the curing and the front door was often opened. The manager was willing to allow this although knowing that it was a damage to the tobacco nearest the door.

The third story was throughout warmer and dryer than the lower part of the barn but the cure was as successful there as elsewhere.

The thermometer on the second floor showed the same temperature as the one on the first floor farthest from the door and the following statements refer to the mean of the readings of these two instruments and to the readings of the sling psychrometer on the first floor.

The time required for filling the barn and curing the leaves was just eleven days and may be conveniently divided into the following periods which are of course quite arbitrary and might differ considerably in different curings.

A	Filling the barn	12	hours.
B	Wilting the leaves	18	"
C	From time of starting the fire till the yellowing began	43	"
D	From yellowing till the brown color began to appear	24	"
E	From D till the rank odor developed	24	"
F	From E till leaves were mostly brown except on midrib	54	"
G	From F till color was satisfactory	18	"
H	Time of drying the midrib and fixing color	38	"
I	Cooling and dampening	34	"
		264	"

It should be said that this is twice as long a time as was required for curing the lower leaves which were picked and cured previously and probably considerably longer than was necessary. But as this kind of tobacco had never been cured before by this process, the expert, Mr. Paschal, wished to go surely if slowly.

Our observations began when the barn was closed and the fires built, at 1 P. M. Aug. 22, the beginning of period C.

1. From the time the fires were fairly going and the flues warmed till the yellow color appeared on the tips and in spots over the leaf, 39 hours, the temperature of the barn fluctuated between 91° and 105° and on the average was 97°.

The relative humidity in the barn was from 86 to 100 and on the average was 92, while that of the outer air averaged 82.

This is a nearly saturated atmosphere and while a good deal of water in the aggregate might evaporate from leaves four-fifths of whose weight was water when they were put in, there is nothing like a rapid drying.

2. From the time when yellow patches first appeared to the first signs of browning, period D, 24 hours, the temperature of the barn varied between 98° and 105° and on the average was 102°.

The relative humidity varied between 78 and 90 or on the average 83, while that of the outer air varied from 77 to 94 and averaged 86.

In this period the temperature has risen five degrees and the humidity has fallen slightly. The leaves are "sweating;" water stands on them in drops. Here again there is no doubt a slow drying but nothing like what would take place in even moderately dry air. The atmosphere of the barn is at this time almost insupportable because of the moisture.

3. In the following 24 hours, period E, the same state of things continues. Temperature between 96 and 101, averaging 99°; relative humidity 74 to 81, averaging 77.

At the end of this period note was first made of a "tobacco odor" difficult to describe but due to an exhalation that was intensely irritating to the eyes and considerably so to the throat. Analyses of the leaves before and after curing do not indicate any considerable loss of nicotine.

4. Next follows a longer period, F, of 54 hours, during which the tobacco odor is very strong, at times almost unbearable even for the time needed to make observations. In this period the

leaves are drying somewhat more rapidly, though entirely limp and damp to the touch, and the curer is waiting for the brown color to spread over the whole leaf and to become dark enough.

Temperature from 99° to 109°, averaging 105°.

Humidity from 62 to 80, averaging 70.

5. Next is a short period, G, of 18 hours, during which the air grows rapidly drier. This period might probably have been omitted and the heat raised at 2 P. M. on the 28th, but for greater security the curer waited.

6. In the last period of the cure the heat was run up to 157° simply to cure and dry out the midribs perfectly. When this was done it was only necessary to cool and dampen the leaves so they could be handled.

Curing of Upper Leaves and Miscellaneous Tobacco.

On Sept. 5 the top leaves from the stalks whose lower and middle leaves were cured in the first and second experiments were picked and put in the barn and as they did not occupy over a quarter of the space, the remaining space was filled with a miscellaneous lot of leaves from different fields.

Time of Observation.	Notes on Process.	Temperature (F).				Relative Humidity.			
		Outside.	In the Building.			Outside.	In the Building.		
			1st Story.	2d Story.	3d Story.		1st Story.	2d Story.	3d Story.
Sept. 5 and 7	Barn filled.								
" 8th, 8 A. M.	Fire started.								
" " 1 P. M.		63	77	79	81	60	95	87	83
" " 4 P. M.		63	81	86	86	60	88	73	77
" " 7 P. M.		58	83	86	87	72	92	77	77
" " 10 P. M.		52	83	85	85	84	92	80	77
" 9th, 2 A. M.		47	81	83	83	93	88	80	80
" " 6 A. M.	Yellowing well started	45	77	79	79	96	87	75	79
" " 10 A. M.		65	83	85	87	56	92	80	77
" " 2 P. M.		68	86	90	91	50	84	68	71
" " 6 P. M.		59	89	92	96	62	88	75	67
" " 10 P. M.		55	87	90	92	70	88	75	69
" 10th, 2 A. M.		48	84	86	87	93	84	73	74
" " 6 A. M.		46	82	85	87	96	80	73	67
" " 10 A. M.		68	89	92	95	60	88	78	72
" " 2 P. M.		75	97	101	104	47	86	74	69

As the leaves were of different degrees of ripeness and of different texture the curing did not proceed with the same rapidity in all cases. The leaves from near the tops of the stalks cured much more rapidly than the others.

During this curing no water was added to the cellar except at the end of the process after the fires were out.

The record of temperature and moisture were taken for the first three days during the most critical part of the process and are given above.

It will be noticed that the temperature in this curing was kept for the first three days from 15° to 20° lower than in the previous curing but the relative humidity in the barn was fully as high if not higher than before. But the curing was equally successful.

Mr. Paschal stated that the heat in the building must be regulated somewhat by the temperature outside which was considerably lower in this curing than in the last. The curing was easily done in six days.

CURING OF STEM SUCKERS.

The first curing, not witnessed by us, was of lower leaves picked by hand on a certain part of a tobacco field. The second curing, described in detail above, was of the middle leaves from which the prime long wrappers are made; the third curing just alluded to was of the shorter upper leaves.

When the lower and middle leaves were picked, from most of the stalks there grew a stem sucker. The season being an exceptionally long and favorable one, these suckers grew leaves of good size which appeared quite fairly ripe and all other tobacco being harvested the barn was filled with the stripped sucker leaves to see if they could be cured. Somewhat to the surprise of every one they cured almost as rapidly as the others. Their texture and color when cured were certainly all that could be desired. They added very considerably to the value of the crop.

It would have added greatly to the value of the observations if there had been opportunity to make notes of the weight of tobacco obtained and the cost of harvesting; and if samples could have been submitted to an expert, who was ignorant of their origin, for a judgment of their texture, color and burning quality comparing each with other portions of the same crop, pole-cured.

The representatives of the Modern Barn System were ready to coöperate in any plans but when the Station was called on by tobacco raisers there was too little time to arrange for any thing more than was done.

The circular referred to in report of Board of Control, p. 11, is here reproduced.

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION.

NEW HAVEN, CONN., November, 1891.

DEAR SIR:

It is said that a larger number of old, well established varieties of Indian corn are grown in Connecticut than in any other State in the Union.

Some of these have been raised in one place for more than a century, and during that time have been strikingly improved by selection.

It is very desirable that specimens of these varieties should be collected, with all available information regarding their names, origin, history, improvement under selection, and actual yield per acre. This is especially so in view of the Columbian Exposition at Chicago in 1893, where there should be a fair exhibit of the leading agricultural products of this State. It is also important that a full set of samples be kept in the State for the instruction of our citizens.

The collection should be begun at once, as it cannot well be made complete in one season. This Station, therefore, asks the coöperation of farmers in an attempt to prepare an exhibit of Indian corn which shall do credit to the State. To this end the Director invites Granges, Farmers' Clubs and Farmers to furnish this Station samples of corn selected from this year's crop, of those varieties which have been raised in Connecticut for a term of years, and of new kinds which are considered valuable.

Ten ears of field-cured corn (with the husk attached if possible) should be selected which fairly represent the *average quality* of the variety. Besides, four ears of extra size of each variety are desirable.

Each ear should be separately wrapped in plenty of dry paper, and the whole, tied firmly together, should be packed with straw in a box; or, if that cannot be done, should be so carefully done up in cotton and stout paper that the ears cannot be in any way injured in transportation. The samples may then be sent by express to the Connecticut Agricultural Experiment Station, New Haven. In all cases the shipper's name should be enclosed in or marked on the package. If several varieties are sent together, each variety should be separately labeled with its name. The Station will pay the express charges.

At the time of forwarding the samples, fill out and return the following blank for each variety.

1. Name most commonly used and all other names which are sometimes applied.
2. How long raised by you or in your town.
3. Where the seed was first got by you.
4. Whether it has changed its habit of growth, and how.
5. Number of rows to ear, ; of ears to stalk.
6. Time of ripening.
7. Average and maximum height of stalks.
8. Average yield of shelled corn and of stalks or stover, under ordinary conditions.
9. Yield under very favorable conditions. State year and specify the conditions.
10. Planted in hill or drill. Number of stalks in hill. Distance between hills and rows, or between plants and rows in drill.
11. How manured and cultivated.
12. Any other data regarding the sample which the sender thinks important.

The Station will receive and store the samples, will keep with each the sender's name and address, and all data regarding the sample, will make such chemical examinations as may seem desirable, and will endeavor to have all the samples properly exhibited at the Columbian Exposition as well as *permanently preserved in the Station Museum.*

In order that the sending of many duplicate samples may be avoided, it is asked that those having corn suitable for the exhibit will *notify the Station at once*, *naming the varieties* which they are prepared to furnish. The Station will then write in reply, advising whether to send or stating that the kind is already sufficiently represented among the samples received or promised.

S. W. Johnson, *Director.*

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THIS VOLUME
DOES NOT
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